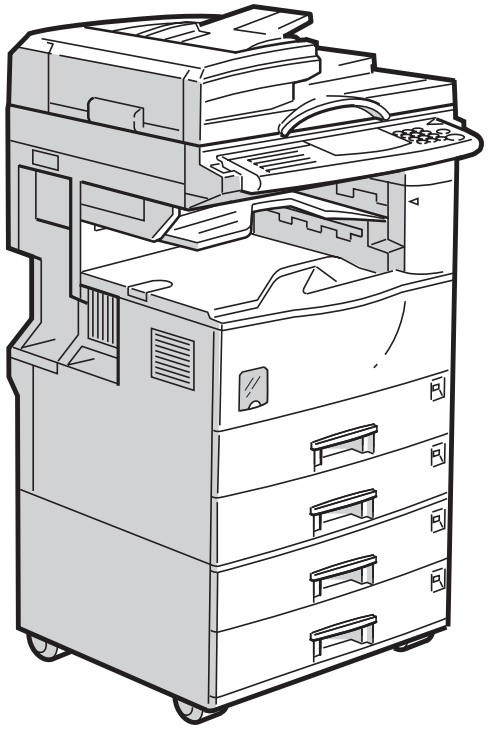
AFICIO A220/A265/A267

SERVICE MANUAL



ZAAH010E

⚠IMPORTANT SAFETY NOTICES

PREVENTION OF PHYSICAL INJURY

1. Before disassembling or assembling parts of the copier and peripherals, make sure that the copier power cord is unplugged.
2. The wall outlet should be near the copier and easily accessible.
3. If any adjustment or operation check has to be made with exterior covers off or open while the main switch is turned on, keep hands away from electrified or mechanically driven components.
4. If a job has started before the copier completes the warm-up or initializing period, keep hands away from the mechanical and electrical components because the starts making copies as soon as the warm-up period is completed.
5. The inside and the metal parts of the fusing unit become extremely hot while the copier is operating. Be careful to avoid touching those components with your bare hands.

HEALTH SAFETY CONDITIONS

Toner is non-toxic, but if you get it in your eyes by accident, it may cause temporary eye discomfort. Try to remove with eye drops or flush with water as first aid. If unsuccessful, get medical attention.

SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL

1. Do not incinerate the toner cassettes. Toner dust may ignite suddenly when exposed to an open flame.
2. Dispose of toner cassettes in accordance with local regulations. (This is a non-toxic unit.)
3. Dispose of replaced parts in accordance with local regulations.

LASER SAFETY

The Center for Devices and Radiological Health (CDRH) prohibits the repair of laser-based optical units in the field. The optical housing unit can only be repaired in a factory or at a location with the requisite equipment. The laser subsystem is replaceable in the field by a qualified Customer Engineer. The laser chassis is not repairable in the field. Customer engineers are therefore directed to return all chassis and laser subsystems to the factory or service depot when replacement of the optical subsystem is required.

⚠WARNING

Use of controls, or adjustment, or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

⚠WARNING FOR LASER UNIT

WARNING: Turn off the main switch before attempting any of the procedures in the Laser Unit section. Laser beams can seriously damage your eyes.

CAUTION MARKING:

laser-4.WMF

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SHIFT TRAY UNIT (B313)

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1. OVERALL MACHINE INFORMATION

1.1 SPECIFICATIONS

Configuration: Desktop

Copy Process: Dry electrostatic transfer system

Originals: Sheet/Book

Original Size: Maximum A3/11" x 17"

Copy Paper Size:
Maximum
A3/11" x 17"
Minimum
A5/8 1/2" x 5 1/2" lengthwise
Custom sizes
2nd paper tray
Width: 100 ~ 297 mm (3.9" ~ 11.5")
Length: 148 ~ 432 mm (5.8" ~ 17.0")
By-pass tray (Option):
Width: 90 ~ 305 mm (3.5" ~ 12.0")
Length: 148 ~ 1,260 mm (5.8" ~ 49.6")

Copy Paper Weight:
Paper Tray:
60 ~ 105 g/m^2, 16 ~ 28 lb (1st paper tray)
60 ~ 157 g/m^2, 16 ~ 43 lb (2nd paper tray)
By-pass (Option):
60 ~ 157 g/m^2, 16 ~ 42 lb

Reproduction Ratios: 5 Enlargement and 7 Reduction

	A4/A3 Version	LT/DLT Version
Enlargement	400% 200% 141% 122% 115%	400% 200% 155% 129% 121%
Full Size	100%	100%
Reduction	93% 87% 82% 71% 65% 50% 25%	93% 85% 78% 73% 65% 50% 25%

Zoom: 25% to 400% in 1% steps (Platen mode)
50% to 200% in 1% steps (ADF mode)

Power Source: 120 V, 60 Hz:
More than 12 A (for North America)
220 ~ 240 V, 50/60 Hz
More than 6 A (for Europe/Asia)
110 V, 50/60 Hz
More than 13 A (for Taiwan)

Power Consumption:

	Mainframe Only		Full System	
	120 V	**220 ~ 240 V**	**120 V**	**220 ~ 240 V**
Maximum	Less than 1.44 kW	Less than 1.44 kW	Less than 1.44 kW	Less than 1.44 kW
Copying	Approx. 500 Wh	Approx. 500 Wh	Approx. 500 Wh	Approx. 500 Wh
Warm-up	Approx. 1.0 kW	Approx. 1.0 kW	Approx. 1.0 kW	Approx. 1.0 kW
Stand-by	Approx. 120 Wh	Approx. 120 Wh	Approx. 130 Wh	Approx. 130 Wh
Low Power Level 1	Approx. 80 Wh	Approx. 85 Wh	Approx. 80 Wh	Approx. 85 Wh
Low Power Level 2	Approx. 50 Wh	Approx. 50 Wh	Approx. 50 Wh	Approx. 50 Wh
Auto Off	10 W	--	10 W	--

NOTE: 1) Full system: Mainframe + ADF + 1-bin Sorter + Paper Tray Unit + Duplex Unit + Bridge Unit + Finisher
2) Without the optional heaters, fax unit, and printer controller

Noise Emission (Sound Power Level):

Stand-by (Mainframe only): US/Asia Model: 40 dB(A)
Europe Model: 40 dB(A)

Operating (Mainframe only): US/Asia Model: 64 dB(A)
Europe Model: 64 dB(A)

Operating (Full System): 67.5 dB(A)

NOTE: 1) The above measurements were made in accordance with ISO 7779.
2) Full System: Mainframe + ADF + 1-bin Sorter + Paper Tray Unit + Duplex Unit + Bridge Unit + Finisher

Dimensions (W x D x H): 550 x 580 x 709 mm (21.7" x 22.8" x 28.0")

NOTE: Measurement Conditions
1) With the paper tray unit or LCT
2) Without the ADF

Weight: Less than 62 kg (136.7 lb)

Copying Speed (copies/minute):

Russian-C1A	**A4 sideways/ 11" x 8 1/2"**	**A3/11" x 17"**
Non-memory copy mode	22	12
Memory copy mode	22	13

Russian-C1B	**A4 sideways/ 11" x 8 1/2"**	**A3/11" x 17"**
Non-memory copy mode	22	12
Memory copy mode	27	15

NOTE: Measurement Conditions
1) Not APS mode
2) A4/LT copying
3) Full size

Warm-up Time: Less than 45 seconds (20°C, 68°F)

First Copy Time: Less than 4.9 s (A4), less than 5.0 s (LT)

NOTE: Measurement Conditions
1) When the polygonal mirror motor is spinning.
2) From the 1st paper tray
3) Not APS mode
4) Full size

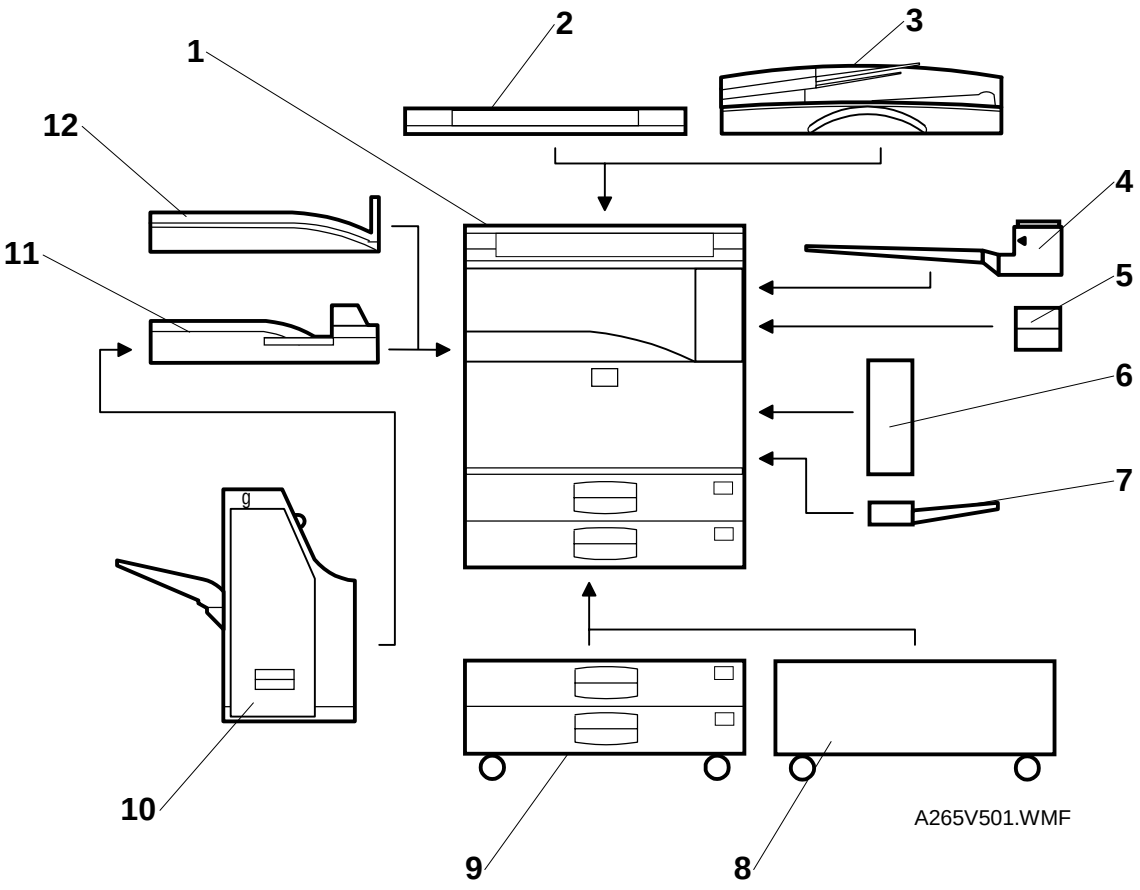
Copy Number Input: Ten-key pad, 1 to 99 (count up or count down)

Manual Image Density: 7 steps

Paper Tray Capacity:	Paper Tray: 500 sheets x 2 (Special paper in the 2nd paper tray: 50 sheets) Paper Tray Unit (Option): 500 sheets x 2 LCT (Option): 1000 sheets x 2 By-pass Tray (Option): 100 sheets (A4, B5, A5, B6, 8 1/2" x 11", 5 1/2" x 8 1/2") 10 sheets (A3, B4, 11" x 17", 8 1/2" x 13") 1 sheets (non-standard sizes) **NOTE:** Copy paper weight: 80g/m^2 (20 lb)
Toner Replenishment:	Cartridge exchange (360 g/cartridge)
Toner Yield:	10 k copies (A4 sideways, 6% full black, 1 to 1 copying, ADS mode)
Copy Tray Capacity:	Copy Tray: 500 sheets (without 1-bin tray) 250 sheets (with 1-bin tray)
Memory Capacity:	Standard 20 MB, Optional memory 48 MB

1.2 MACHINE CONFIGURATION

1.2.1 SYSTEM COMPONENTS



Version	Item	Machine Code	Common with	No.
Copier	Copier (Russian-C1A)	A265		1
	Copier (Russian-C1B)	A267		1
	ARDF (Optional)	A858		3
	Platen Cover (Optional)	A893	Stinger-C	2
	Paper Tray Unit - 2 tray (Optional)	A860-11, -21, -56		9
	LCT (Optional)	A862		8
	1-bin Tray (Optional)	A898		4
	Shift Tray (Optional)	B313		12
	Duplex Unit (Optional)	A896		6
	By-pass Tray (Optional)	A899		7
	Interchange Unit (Optional)	B300		5
	Bridge Unit (Optional)	A897		11
	1000-sheet Finisher (Optional)	A681	NAD	10
	Copier Feature Expander - Memory 48 MB (Optional)	A887	Stinger-C	
	Key Counter Bracket		Adam	
Fax	Fax Controller (Optional)	A895-01, -02, -03		
	G3 Interface Unit (Optional)	A895-11, -12		
	Handset (Optional)	H160	Adam	
	ISDN (Optional)	A895-21, -22		
	PC Fax Expander (Optional)	A894	Stinger-C	
	Fax Function Expander (Optional)	A892	Stinger-C	
Printer	Printer Controller (Optional)	B306		
	PostScript Kit (Optional)	B308	Stinger-C	
	HDD (Optional)	G690	Stinger-C	
	NIB (Optional)	B307	Stinger-C	
	Memory 32 or 64 MB (Optional)	G688	Stinger-C	
Scanner	Scanner Controller (Optional)	A844		

1.2.2 INSTALLABLE OPTION TABLE

Copier options

No.	Option	Russian-C1A/C1B	Note
1	ARDF (Optional)	❍	Install either no. 1 or 2
2	Platen Cover (Optional)	❍	Install either no. 1 or 2
3	Paper Tray Unit - 2 tray (Optional)	❍	Install either no. 3 or 4
4	LCT (Optional)	❍	Install either no. 3 or 4
5	1-bin Tray (Optional)	Δ	Requires no.9
6	Shift Tray (Optional)	❍	Install either no. 6 or 10
7	Duplex Unit (Optional)	Δ	Requires no.9
8	By-pass Tray (Optional)	❍	
9	Interchange Unit (Optional)	❍	
10	Bridge Unit (Optional)	Δ	No. 10 requires no.11 Install either no. 6 or 10
11	1000-sheet Finisher (Optional)	Δ	Requires no.10, 12 and either no.3 or 4
12	Memory 48 MB (Optional)	❍	
13	Key Counter Bracket	❍	

❍ = Available Δ = Requires another option

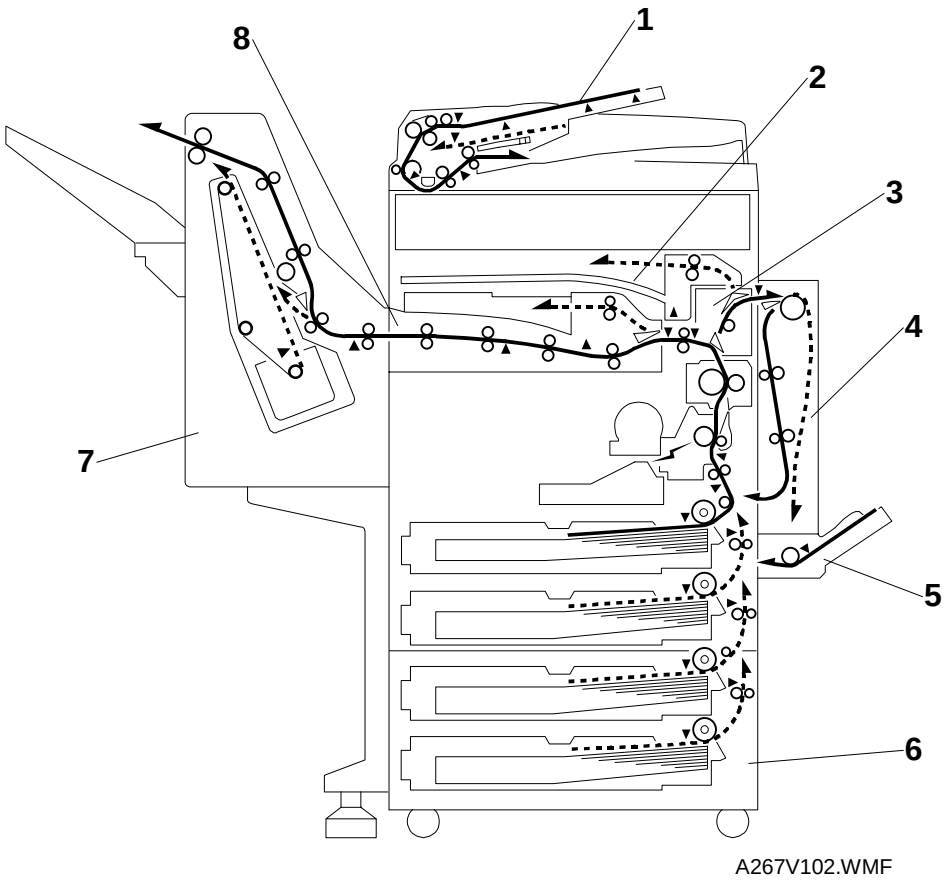
Fax and printer options

All options for the fax and printer units are available when these units have been installed.

Scanner option

When the scanner option is installed, the printer option must be installed.

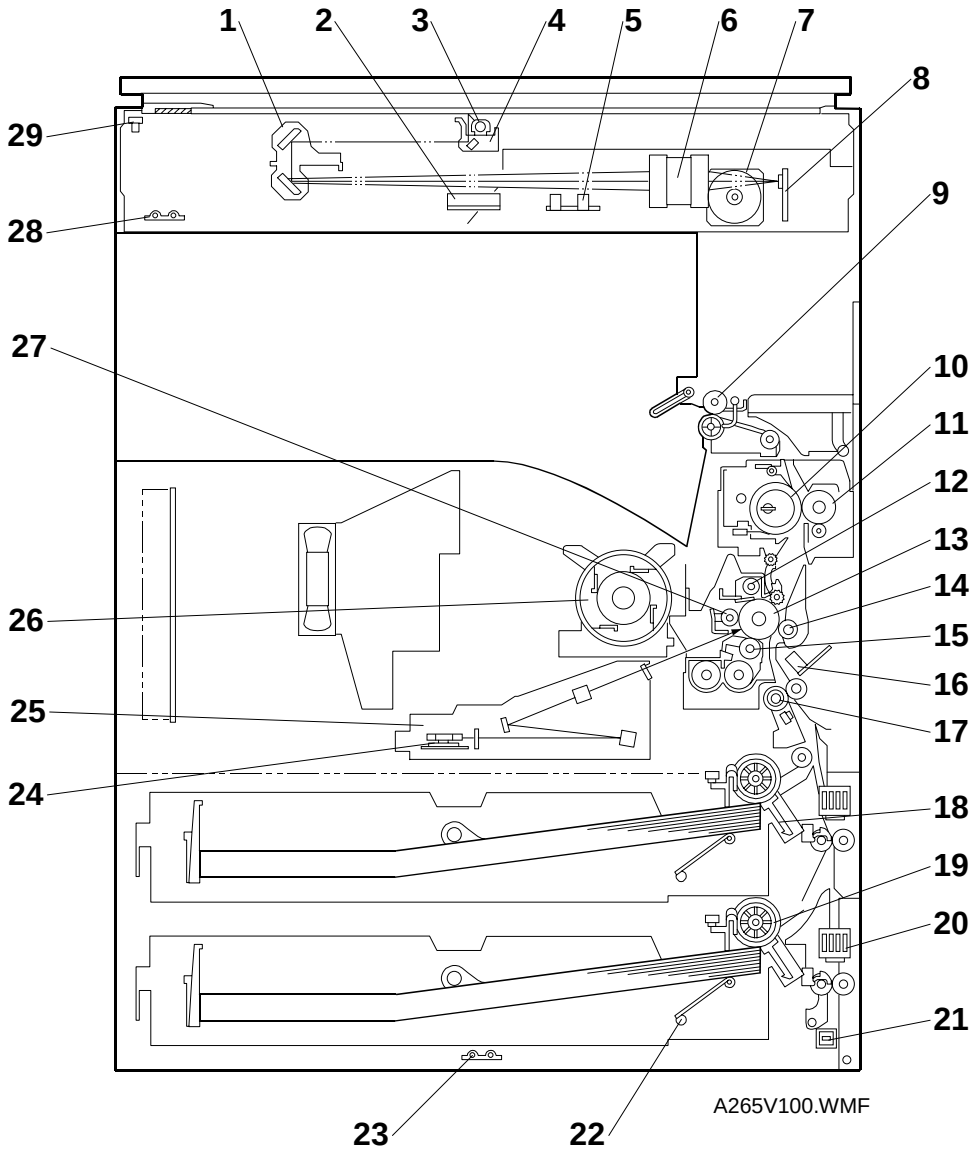
1.3 PAPER PATH



A267V102.WMF

1. Optional ADF
2. Optional 1-bin Tray
3. Optional Interchange Unit
4. Optional Duplex Unit
5. Optional By-pass Feed Tray
6. Optional Paper Tray Unit
7. Optional 1000-sheet Finisher
8. Optional Bridge Unit

1.4 MECHANICAL COMPONENT LAYOUT



1. 2nd scanner
2. Original width sensor
3. Exposure lamp
4. 1st scanner
5. Original length sensor
6. Lens
7. Scanner motor
8. SBU board
9. Exit roller
10. Fusing hot roller
11. Fusing pressure roller
12. Cleaning unit
13. OPC drum
14. Transfer roller
15. Development roller
16. ID sensor
17. Registration roller
18. Friction pad
19. Paper feed roller
20. Paper size sensor
21. Special paper sensor
22. Bottom plate
23. Tray heater
24. Polygon mirror motor
25. Laser unit
26. Toner supply bottle holder
27. Drum charge roller
28. Anti-condensation heater
29. Scanner home position sensor

1.5 ELECTRICAL COMPONENT DESCRIPTIONS

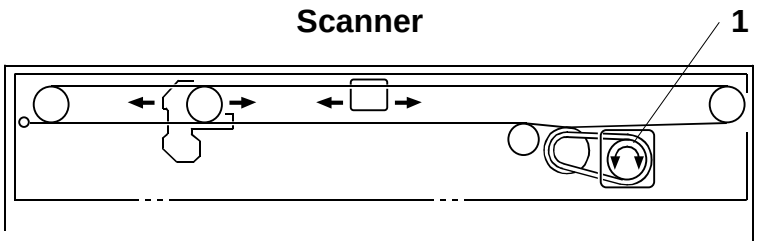
Refer to the electrical component layout on the reverse side of the point-to-point diagram for the location of the components.

Symbol	Name	Function
Motors		
M1	Scanner	Drives the 1st and 2nd scanners.
M2	Polygonal Mirror	Turns the polygonal mirror.
M3	Main	Drives the main unit components.
M4	Exhaust Fan	Removes heat from around the fusing unit.
M5	Upper Paper Lift	Raises the bottom plate in the 1st paper tray.
M6	Lower Paper Lift	Raises the bottom plate in the 2nd paper tray.
M7	Toner Supply	Rotates the toner bottle to supply toner to the development unit.
Magnetic Clutches		
MC1	Upper Paper Feed	Starts paper feed from the 1st paper tray.
MC2	Lower Paper Feed	Starts paper feed from the 2nd paper tray.
MC3	Upper Relay	Drives the upper relay rollers.
MC4	Lower Relay	Drives the lower relay rollers.
MC4	Registration	Drives the registration rollers.
Switches		
SW1	Main	Provides power to the machine. If this is off, there is no power supplied to the machine.
SW2	Right Upper Cover	Detects whether the right upper cover is open or not.
SW3	Right Cover	Cuts the +5VLD and +24V dc power line and detects whether the right cover is open or not.
SW4	Right Lower Cover	Detects whether the right lower cover is open or not.
SW5	Upper Paper Size	Determines what size of paper is in the upper paper tray.
SW6	Lower Paper Size	Determines what size of paper is in the lower paper tray.
SW7	Special Paper	Determines whether there is special paper in the lower paper tray.
SW8	New PCU Detect	Detects when a new PCU is installed.
SW9	Front Cover Safety	Cuts the +5VLD and +24V dc power line and detects whether the front cover is open or not.
SW10	Operation	Provides power for machine operation. The machine still has power if this switch is off.

Symbol	Name	Function
Sensors		
S1	Scanner HP	Informs the CPU when the 1st and 2nd scanners are at home position.
S2	Platen Cover	Informs the CPU that the platen cover is in the up or down position (related to the APS/ARE functions).
S2	Original Width	Detects original width. This is one of the APS (Auto Paper Select) sensors.
S4	Original Length 1	Detects original length. This is one of the APS (Auto Paper Select) sensors.
S5	Original Length 2	Detects original length. This is one of the APS (Auto Paper Select) sensors.
S6	Toner Density (TD)	Detects the amount of toner inside the development unit.
S7	1st Paper End	Informs the CPU when the 1st paper tray runs out of paper.
S8	2nd Paper End	Informs the CPU when the 2nd paper tray runs out of paper.
S9	Image Density (ID)	Detects the density of various patterns and the reflectivity of the drum for process control.
S10	Paper Overflow	Detects paper overflow in the built-in copy tray.
S11	Paper Exit	Detects misfeeds.
S12	Upper Relay	Detects misfeeds.
S13	Lower Relay	Detects misfeeds.
S14	Registration	Detects misfeeds and controls registration clutch off-on timing.
S15	1st Paper Lift	Detects when the paper in the 1st paper tray is at the feed height.
S16	2nd Paper Lift	Detects when the paper in the 2nd paper tray is at the feed height.
S17	1st Paper Height – 1	Detects the amount of paper in the 1st paper tray.
S18	1st Paper Height – 2	Detects the amount of paper in the 1st paper tray.
S19	2nd Paper Height – 1	Detects the amount of paper in the 2nd paper tray.
S20	2nd Paper Height – 2	Detects the amount of paper in the 2nd paper tray.
PCBs		
PCB1	BICU (Base Engine and Image Control Unit)	Controls all base engine functions both directly and through other control boards.
PCB2	PSU (Power Supply Unit)	Provides dc power to the system and ac power to the fusing lamp and heaters.
PCB3	IOB (Input/Output Board)	Controls the fusing lamp and the mechanical parts of the machine.
PCB4	SBU (Sensor Board Unit)	Contains the CCD, and outputs a video signal to the BICU board.
PCB5	Lamp Stabilizer	Stabilizes the power to the exposure lamp.
PCB6	LDD (Laser Diode Driver)	Controls the laser diode.
PCB7	Operation Panel	Controls the operation panel.

Symbol	Name	Function
PCB8	High Voltage Supply	Supplies high voltage to the drum charge roller, development roller, and transfer roller.
PCB9	Memory (Option)	Expands the memory capacity for the copier features.
Lamps		
L1	Exposure Lamp	Applies high intensity light to the original for exposure.
L2	Fusing Lamp	Heats the hot roller.
L3	Quenching Lamp	Neutralizes any charge remaining on the drum surface after cleaning.
Heaters		
H1	Anti-condensation (Option)	Turns on when the main power switch is off to prevent moisture from forming on the optics.
H2	Tray (Option)	Turns on when the main power switch is off to prevent moisture from forming around the paper trays.
Others		
TF1	Fusing Thermofuse	Opens the fusing lamp circuit if the fusing unit overheats.
TH1	Fusing Thermistor	Detects the temperature of the hot roller.
LSD 1	Laser Synchronization Detector	Detects the laser beam at the start of the main scan.
CO1	Mechanical Counter	Keeps track of the total number of prints made.
CO2	Key Counter (Option)	Used for control of authorized use. If this feature is enabled for copying, copying will be impossible until it is installed.

1.6 DRIVE LAYOUT



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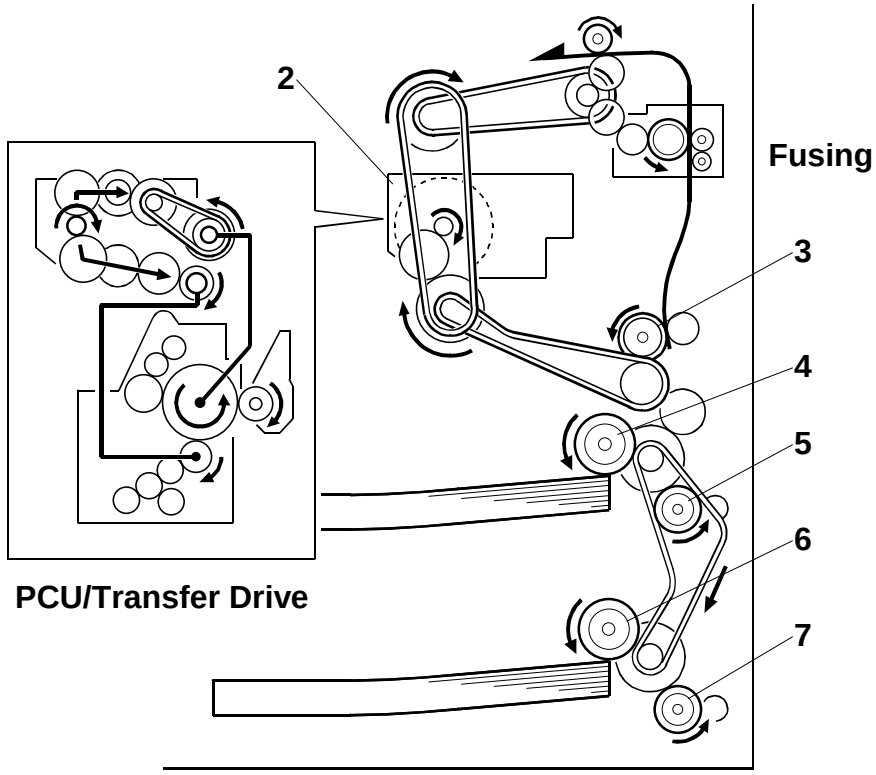

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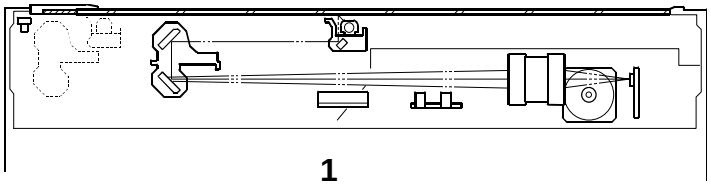
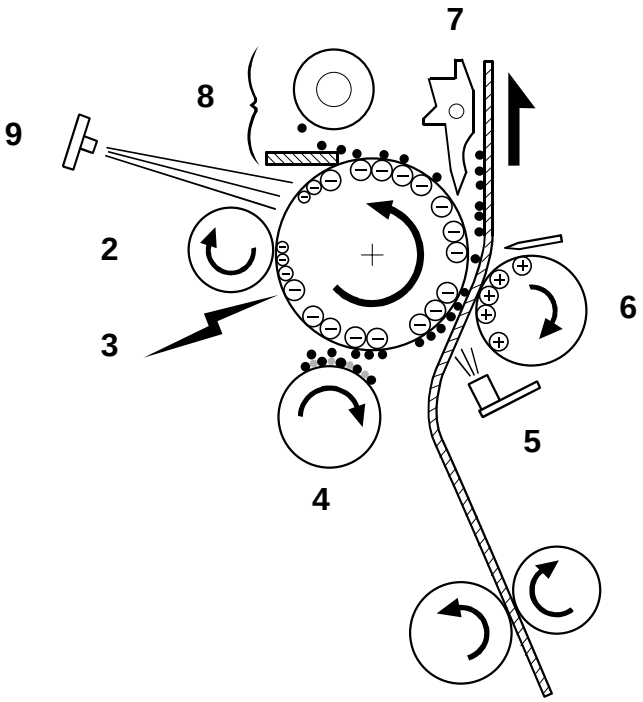
1. Scanner Drive Motor
2. Main Motor
3. Registration Clutch
4. Upper Paper Feed Clutch
5. Upper Transport Clutch
6. Lower Paper Feed Clutch
7. Lower Transport Clutch

1.7 COPY PROCESS

1.7.1 OVERVIEW



A267V401.WMF



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1. EXPOSURE

A xenon lamp exposes the original. Light reflected from the original passes to the CCD, where it is converted into an analog data signal. This data is converted to a digital signal, processed and stored in the memory. At the time of printing, the data is retrieved and sent to the laser diode. For multi-copy runs, the original is scanned once only and stored to the memory.

2. DRUM CHARGE

In the dark, the charge roller gives a negative charge to the organic photo-conductive (OPC) drum. The charge remains on the surface of the drum because the OPC layer has a high electrical resistance in the dark.

3. LASER EXPOSURE

The processed data scanned from the original is retrieved from the memory and transferred to the drum by a laser beam, which forms an electrical latent image on the drum surface. The amount of charge remaining as a latent image on the drum depends on the laser beam intensity, which is controlled by the BICU board.

4. DEVELOPMENT

The magnetic developer brush on the development rollers comes in contact with the latent image on the drum surface. Toner particles are electrostatically attached to the areas of the drum surface where the laser reduced the negative charge on the drum.

5. ID SENSOR

The laser forms a sensor pattern on the drum surface. The ID sensor measures the reflectivity of the pattern. The output signal is one of the factors used for toner supply control. Also, the ID sensor measures the reflectivity of the drum surface. The output signal is used for charge roller voltage control.

6. IMAGE TRANSFER

Paper is fed to the area between the drum surface and the transfer roller at the proper time for aligning the copy paper and the developed image on the drum surface. Then, the transfer roller applies a high positive charge to the reverse side of the paper. This positive charge pulls the toner particles from the drum surface onto the paper. At the same time, the paper is electrostatically attracted to the transfer roller.

7. PAPER SEPARATION

Paper separates from the drum as a result of the electrostatic attraction between the paper and the transfer roller. The discharge plate helps separate the paper from the drum.

8. CLEANING

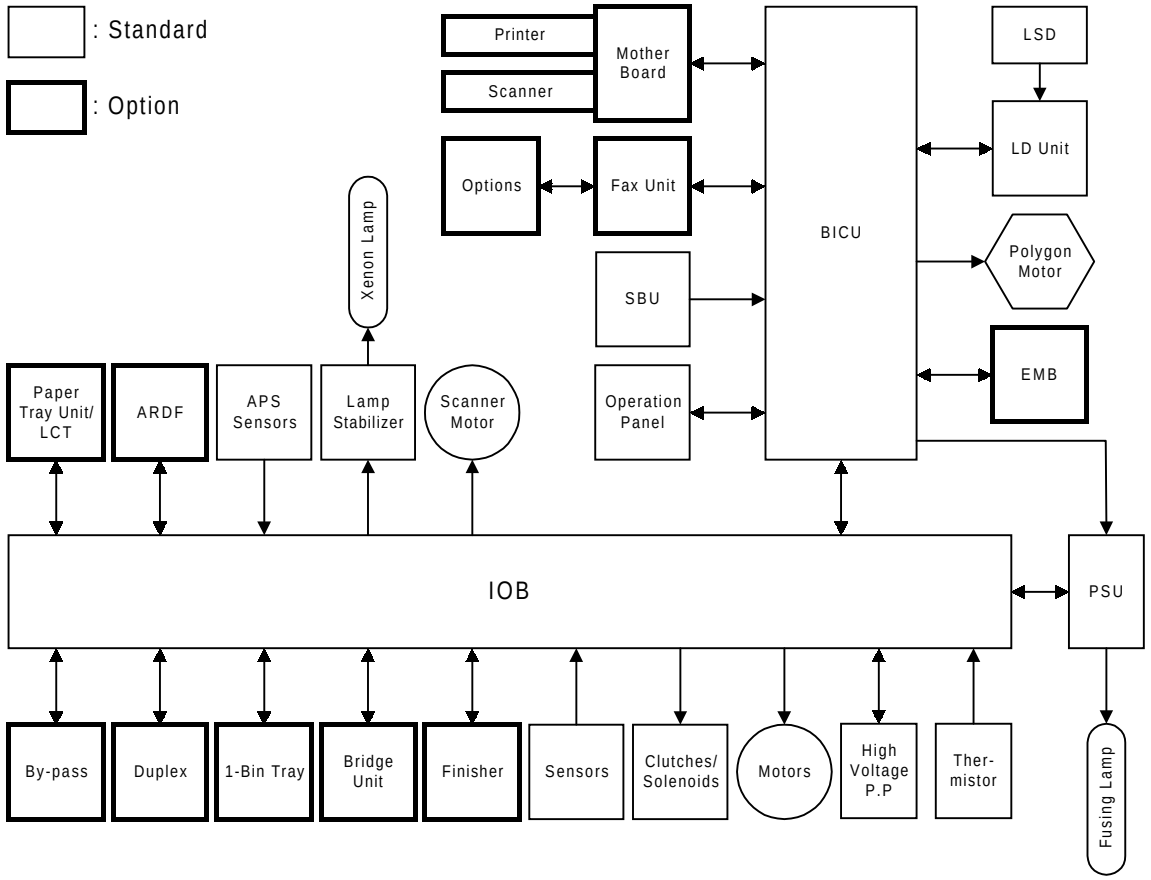
The cleaning blade removes any toner remaining on the drum surface after the image transfers to the paper.

9. QUENCHING

The light from the quenching lamp electrically neutralizes the charge on the drum surface.

1.8 BOARD STRUCTURE

1.8.1 OVERVIEW



A267V500.WMF

1.8.2 DESCRIPTION

1. BICU (Base Engine and Image Control Unit)

The main board controls the following functions:

- Engine sequence
- Scanner, laser printer engine
- Timing control for peripherals
- Image processing, video control
- Operation control
- Various application boards (fax, printer, scanner)
- Machine control, system control

2. IOB (I/O Board)

The IOB handles the following functions:

- Drive control for the sensors, motors, and solenoids of the printer and scanner
- High voltage control board control
- Serial interfaces with peripherals
- Fusing control

3. SBU (Sensor Board Unit)

The SBU deals with the analog signals from the CCD and converts them into digital signals.

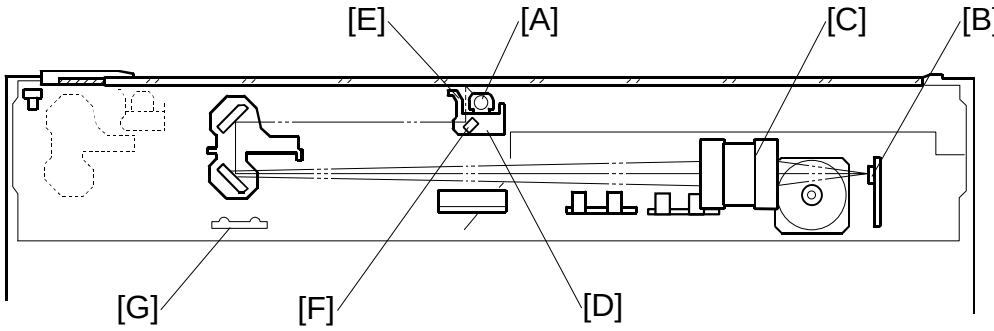
4. Mother Board (Option)

This board interfaces the BICU with the printer controller and/or the scanner controller. The mother board is part of the expansion box option.

2. DETAILED SECTION DESCRIPTIONS

2.1 SCANNING

2.1.1 OVERVIEW



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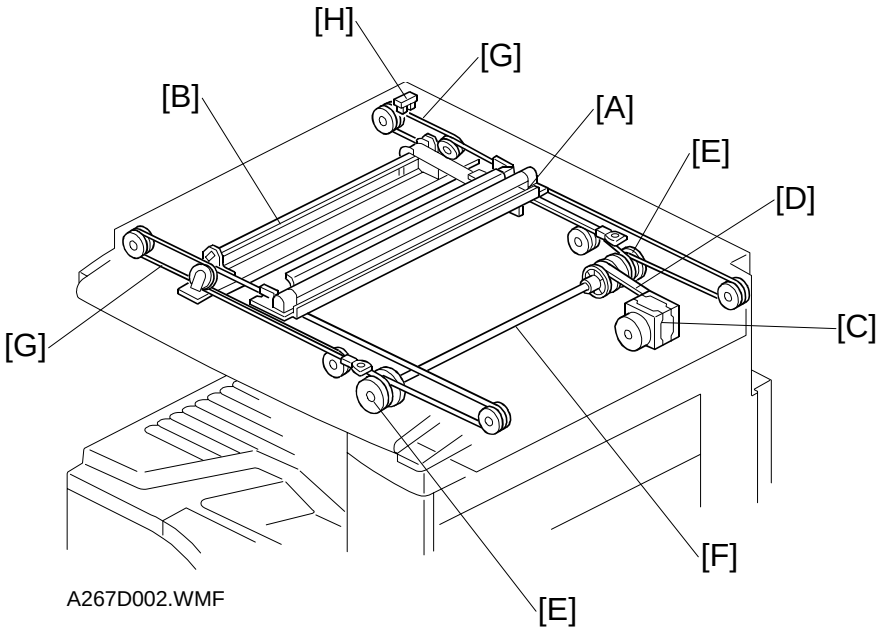
The original is illuminated by the exposure lamp (a xenon lamp in this model) [A]. The image is reflected onto a CCD (charge coupled device) [B] via the 1st, 2nd, 3rd mirrors, and lens [C].

The 1st scanner [D] consists of the exposure lamp, a reflector [E], and the 1st mirror [F].

A lamp stabilizer energizes the exposure lamp. The light reflected by the reflector is of almost equal intensity, to reduce shadows on pasted originals.

An optics anti-condensation heater [G] is available as an option. It can be installed on the left side of the scanner. It turns on whenever the power cord is plugged in.

2.1.2 SCANNER DRIVE



A stepper motor drives the scanner. The 1st and 2nd scanners [A,B] are driven by the scanner drive motor [C] through the timing belt [D], scanner drive pulley [E], scanner drive shaft [F], and two scanner wires [G].

- Book mode -

The scanner drive board controls and operates the scanner drive motor. In full size mode, the 1st scanner speed is 122 mm/s during scanning. The 2nd scanner speed is half that of the 1st scanner.

In reduction or enlargement mode, the scanning speed depends on the magnification ratio. The returning speed is always the same, whether in full size or magnification mode. The image length change in the sub scan direction is done by changing the scanner drive motor speed, and in the main scan direction it is done by image processing on the BICU board.

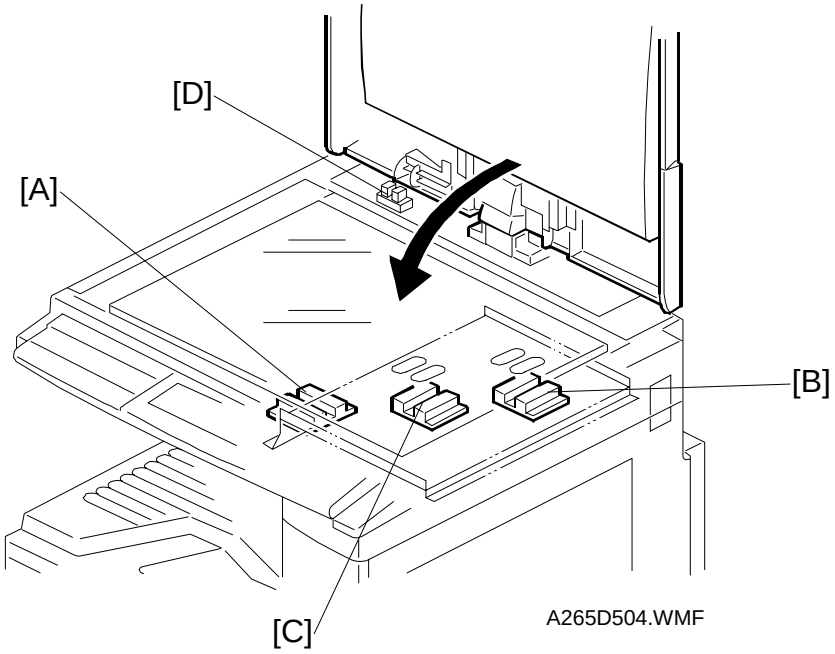
Magnification in the sub-scan direction can be adjusted by changing the scanner drive motor speed using SP4-101. Magnification in the main scan direction can be adjusted using SP4-008.

- ADF mode -

The scanners are always kept at their home position (the scanner H.P sensor [H] detects the 1st scanner) to scan the original. The ADF motor feeds the original through the ADF. In reduction/enlargement mode, the image length change in the sub-scan direction is done by changing the ADF motor speed. Magnification in the main scan direction is done in the BICU board, like for book mode.

Magnification in the sub-scan direction can be adjusted by changing the ADF motor speed using SP6-007. In the main scan direction, it can be adjusted with SP4-008, like for book mode.

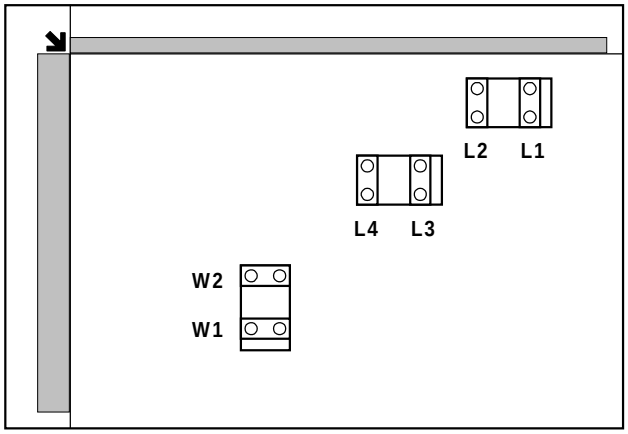
2.1.3 ORIGINAL SIZE DETECTION IN PLATEN MODE



In the optics cavity for original size detection, there are four reflective sensors in the 115V machines ([A] and [B]), and six reflective sensors in the 230V machines. The original width sensors [A] detect the original width, and the original length sensors [B] and [C] detect the original length. These are the APS (Auto Paper Select) sensors. Each APS sensor is a reflective photosensor.

While the main switch is on, these sensors are active and the original size data is always sent to the CPU. However, the CPU checks the data only when the platen cover sensor [D] is activated. This is when the platen is positioned about 15 cm above the exposure glass, for example while it is being closed. The CPU can recognize the original size from the combination of on/off signals from the APS sensors.

If the copy is made with the platen fully open, the CPU decides the original size from the sensor outputs when the Start key is pressed.



A265D505.WMF

Original Size		Length Sensor				Width Sensor	
A4/A3 version	**LT/DLT version**	**L4**	**L3**	**L2**	**L1**	**W2**	**W1**
A3	11” x 17”	O	O	O	O	O	O
B4	10” x 14”	O	O	O	O	O	X
Foolscap	8.5” x 13”	O	O	O	X	X	X
A4-L	8.5” x 11”	O	O	X	X	X	X
B5-L		O	X	X	X	X	X
A4-S	11” x 8.5”	X	X	X	X	O	O
B5-S		X	X	X	X	O	X
A5-L, A5-S		X	X	X	X	X	X

NOTE: 1) L: Lengthwise, S: Sideways, O: High (paper present), X: Low
2) The length sensors L3 and L4 are used only for 230V machines.

For other combinations, "CANNOT DETECT ORIG. SIZE" will be indicated on the operation panel display (if SP 4-303 is kept at the default setting).

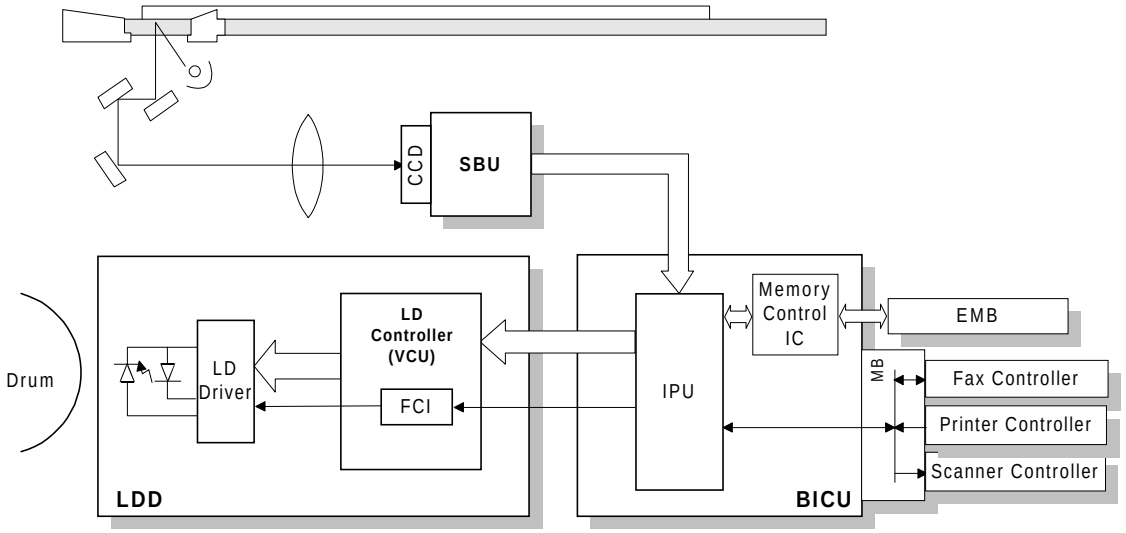
The above table shows the outputs of the sensors for each original size. This original size detection method eliminates the necessity for a pre-scan and increases the machine's productivity.

However, if the by-pass feeder is used, note that the machine assumes that the copy paper is lengthwise. For example, if A4 sideways paper is placed on the by-pass tray, the machine assumes it is A3 paper and scans the full A3 area for the first copy of each page of the original, disregarding the original size sensors. However, for each page, the data signal to the laser diode is stopped to match the copy paper length detected by the registration sensor.

Original size detection using the ADF is described in the manual for the ADF.

2.2 IMAGE PROCESSING

2.2.1 OVERVIEW



A265D500.WMF

The CCD generates an analog video signal. The SBU (Sensor Board Unit) converts the analog signal to an 8-bit digital signal, then it sends the digital signal to the BICU (Base-engine and Image Control Unit) board.

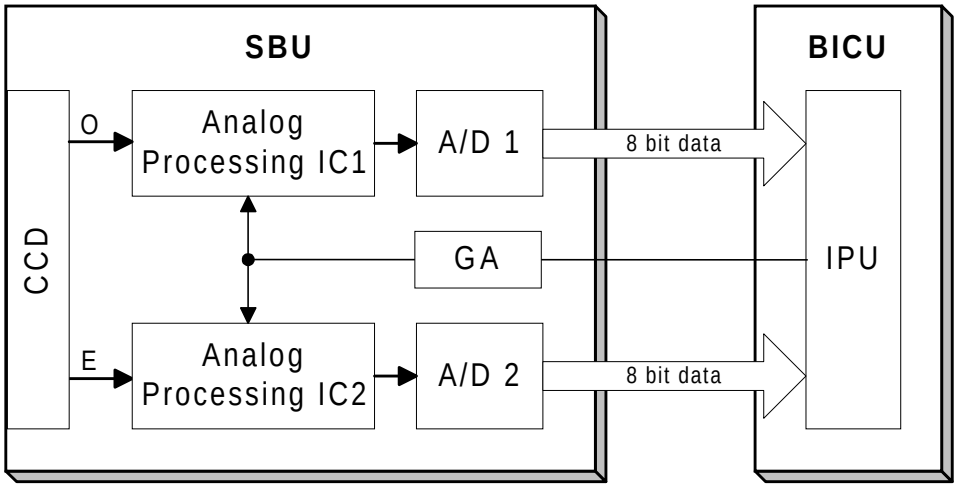
The BICU board can be divided into three image processing blocks; the IPU (Image Processing Unit), FCI (Fine Character Image), and LD controller (VCU).

- IPU: Auto shading, filtering, magnification, γ correction, and gradation processing
- LD controller: LD print timing control and laser power PWM control
- FCI (inside the LD controller): Smoothing (binary picture processing mode only)

Finally, the BICU board sends the video data to the LD drive board at the correct time.

The EMB board is the copier feature expander option, which provides extra memory for the copier features.

2.2.2 SBU (SENSOR BOARD UNIT)



A265D501.WMF

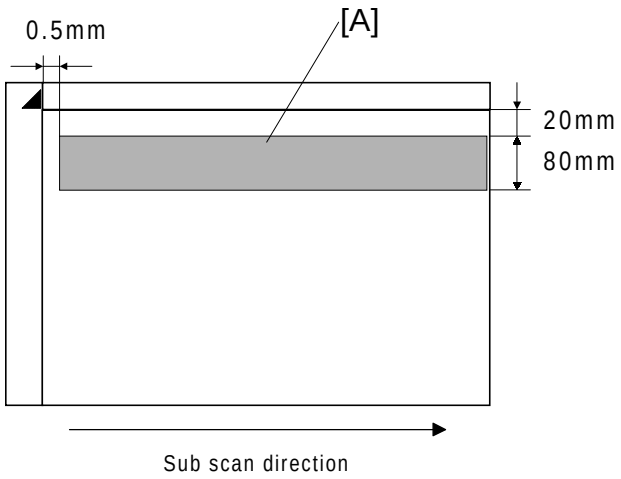
The CCD converts the light reflected from the original into an analog signal. The CCD line has 7,450 pixels and the resolution is 600 dpi (23.6 lines/mm).

The CCD has two output lines, for odd and even pixels, to the analog processing IC. The analog processing IC performs the following operations on the signals from the CCD:

1. Z/C (Zero Clamp):
   Adjusts the black level reference for even pixels to match the odd pixels.
2. Signal Amplification:
   The analog signal is amplified by operational amplifiers in the AGC circuit. The maximum gains of the operational amplifiers are controlled by the CPU on the BICU board.

After the above processing, the analog signals are converted to 8-bit signals by the A/D converter. This will give a value for each pixel on a scale of 256 grades. Then, the digitized image data goes to the BICU board.

2.2.3 AUTO IMAGE DENSITY



A265D502.WMF

In the SBU

ADS prevents the background of an original from appearing on copies.

The copier scans the auto image density detection area [A] as shown in the diagram. This corresponds to a few mm at one end of the main scan line. As the scanner scans down the page, the IPU on the BICU detects the peak white level for each scan line. The IPU determines the reference value for the A/D conversion for a particular scan line using the peak white level for that scan line. Then, the IPU sends the reference value data to the reference controller on the SBU.

When an original with a gray background is scanned, the density of the gray area is the peak white level density. Therefore, the original background will not appear on copies. Because peak level data is taken for each scan line, ADS corrects for any changes in background density down the page.

As with previous digital copiers, the user can select manual image density when selecting auto image density mode, and the machine will use both settings when processing the original.

In the IPU

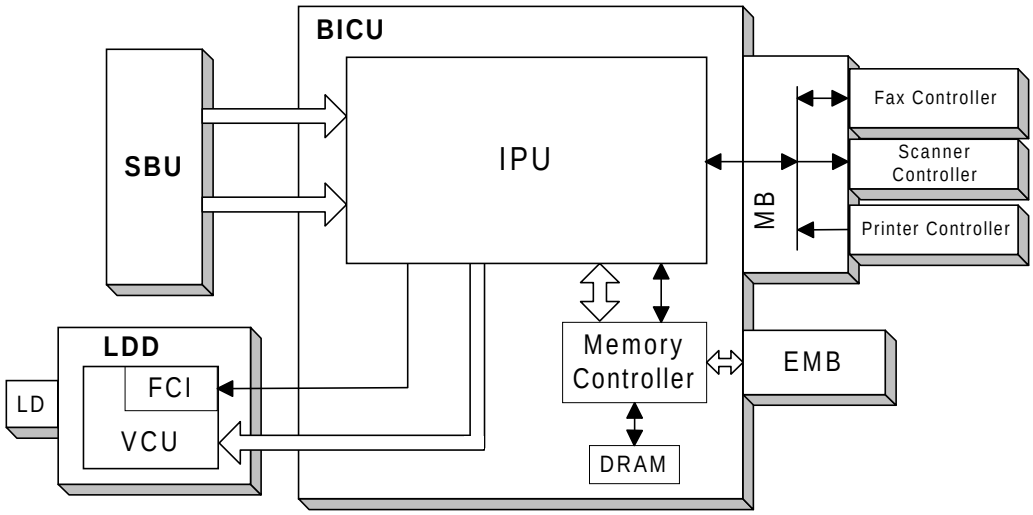
After the SBU process, the IPU board removes background noise resulting from the SBU-BICU wiring by adjusting the white level.

"Service Mode" Original Types

If the user selects a "Service Mode" original type with the user tools, these two ADS process can be either enabled or disabled (SP4-936, SP4-937), and the amount of white level change for the IPU ADS process can be adjusted (SP4-938).

2.2.4 IPU (IMAGE PROCESSING UNIT)

Overview



A265D503.WMF

The image data from the SBU goes to the IPU (Image Processing Unit) IC on the BICU board, which carries out the following processes on the image data.

1. Auto shading
2. Scanner gamma correction
3. Filtering (MTF and smoothing)
4. Magnification
5. ID gamma correction
6. Grayscale processing
7. Binary picture processing
8. Error diffusion
9. Dithering
10. Video path control
11. Test pattern generation

The image data then goes to the LD driver (LDD).

Image Processing Modes

The user can select text, text/photo, and photo original types, as usual. However, each of these original types has a range of different choices (such as ”sharp text”, “glossy photo”, etc). these are listed in the table on the following page.

- Notice that there is a “Service Mode” for each of the text, text/photo, and photo original modes. This is a customizable mode, with a range of SP modes that can be adjusted to meet user requirements that are not covered by the other original modes.

In addition, there are two main image processing modes: grayscale processing mode (called “Enhanced Mode” on the display) and binary picture processing mode (called “Normal Mode” on the display). Either of these can be selected for each original type.

The user can select the modes that best suit their original with the following user tools:

- Greyscale/Binary Picture: UP mode - 2. Copier – 1. General Features – 08. Image Mode Select
- Original Type: UP mode - 2. Copier – 1. General Features – 09. Image Mode Adjustment (select text, text/photo, or photo at the operation panel, then select the sub-type with this UP mode)

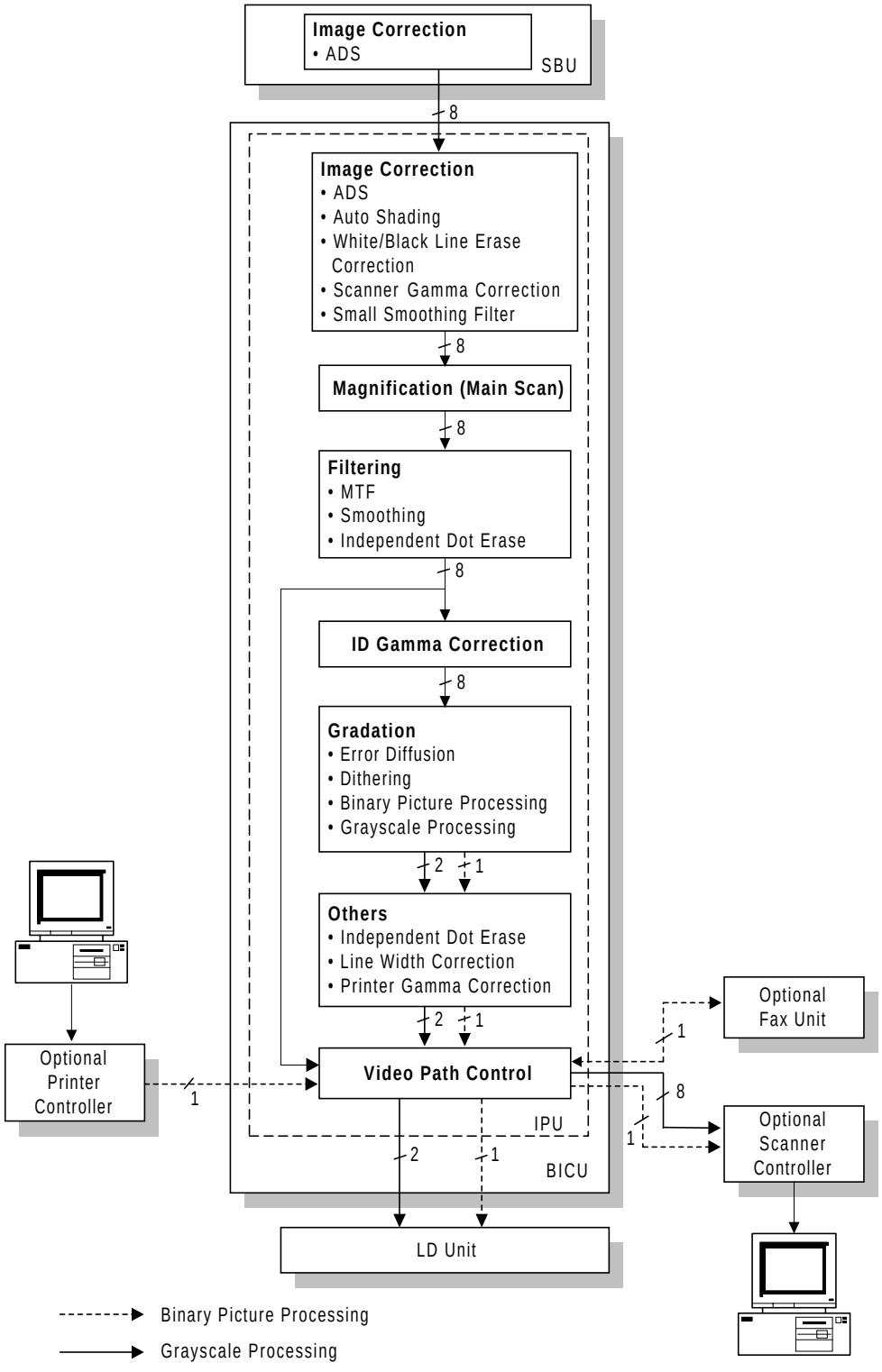
For details of the SP modes that can be used to adjust the image quality for all the original modes, see the “SP Modes for Each Image Processing Step” section.

	Original Type	Mode	Targeted Original Type
Normal Mode (Binary Picture Processing)	Text	Normal	Normal text originals
		Sharp	Newspaper, originals through which the rear side is visible
		Service mode	Default: Printouts from dot matrix printers
	Text/Photo	Photo priority	Text/photo originals which contain mainly photo areas
		Text priority	Text/photo originals which contain mainly text areas
		Service mode	Default: Colored originals (with blue or green text or background)
	Photo	Coarse print	Coarse-grained printed originals, with no text
		Press print	Fine-grained printed originals, with no text
		Glossy photo	Glossy photos
		Service mode	Default: Fine-grained printed originals, with no text.
Enhanced Mode (Grayscale Processing)	Text	Pale	Originals with low contrast text (such as written by a pencil)
		Normal	Normal text originals
		Generation	Copied originals
		Service mode	Default: Printouts from dot matrix printers
	Text/Photo	Text priority	Text/photo originals which contain mainly text areas
		Normal	Text/photo originals
		Photo priority	Text/photo originals which contain mainly photo areas
		Service mode	Default: Colored originals (with blue or green text or background)
	Photo	Press print	Fine-grained printed originals, with no text.
		Normal	Normal photos
		Glossy Photo	Glossy photos
		Service mode	Default: Normal photos

Image Processing Path

Overview

This diagram shows the various stages of the image process and where they are done.



A265D509.WMF

SP Modes for Each Image Processing Step

The following tables show which SP modes are used for each step in image processing mode.

There are also some SP modes specifically for use with the positive/negative feature:

- 4-403: Can be used to disable greyscale processing for this feature
- 4-947: MTF
- 4-948: Dynamic threshold maximum and minimum limits

Text Mode, Binary Picture Processing

	Text Mode		
	Normal	**Sharp**	**Service Mode**
ADS (SBU)	As selected at the operation panel		As on the op panel 4-936-4
ADS (IPU)	As selected at the operation panel		As on the op panel 4-937-4, 4-938-4
Shading Correction	Enabled		Enabled
White Line Correction	Enabled 4-942		Enabled 4-918-4
Black Line Correction	Enabled (DF only) 4-943	Enabled (DF only) 4-943	Strong (DF only) 4-919-4
Scanner γ Correction	AE linear		Linear 4-928-4
Small Smoothing Filter	Not used	Normal	Normal 4-921-3
Main Scan Magnification	Enabled		
Mirroring	Enabled only in the ADF mode		
MTF/Smoothing Filter	MTF (Medium)	MTF (Weak)	MTF (Weak) 4-915-23~34 4-916-23~34
Independent Dot Erase	Weak 4-944 (Enable/disable)		Strong 4-917-3
ID γ Correction	Text / normal	Text / sharp	Text / sharp 4-940-4
Gradation	Error diffusion	Binary picture processing	
Threshold	Dynamic	Dynamic	Dynamic 4-922-1 4-923 ~ 4-926 4-931 ~ 4-934
Independent Dot Erase (after image process)	None		None 4-939
Line Width Correction	Disabled		Thinner Lines (medium) 4-935-4

Text Mode, Grayscale Processing

	Text Mode			
	Pale	**Normal**	**Generation**	**Service Mode**
ADS (SBU)	As selected at the operation panel			As op panel 4-936-1
ADS (IPU)	As selected at the operation panel			As op panel 4-937-1 4-938-1
Shading Correction	Enabled			Enabled
White Line Correction	Enabled 4-942			Enabled 4-918-1
Black Line Correction	Enabled (DF only) 4-943			Strong (DF only) 4-919-1
Scanner γ Correction	AE linear			Linear 4-928-1
Small Smoothing Filter	Normal			Normal 4-921-1
Main Scan Magnification	Enabled			
Mirroring	Enabled only in the ADF mode			
MTF/Smoothing Filter	MTF (Medium)			MTF (Medium) 4-915-1~10 4-916-1~10
Independent Dot Erase	Weak 4-944 (Enable/disable)			Strong 4-917-1
ID γ Correction	Text			Text 4-940-1
Gradation	Error diffusion			
Threshold	Constant			Constant 4-929-1
Independent Dot Erase (after image process)	None			None 4-939
Line Width Correction	Thick (Medium)	Disabled	Thin (Medium)	Disabled 4-935-1

Text/Photo Mode, Binary Picture Processing

	Text/Photo Mode		
	Photo Priority	**Text Priority**	**Service Mode**
ADS (SBU)	As selected at the operation panel		As on the op panel 4-936-5
ADS (IPU)	As selected at the operation panel		As on the op panel 4-937-5, 4-938-5
Shading Correction	Enabled		Enabled
White Line Correction	Enabled 4-942		Enabled 4-918-5
Black Line Correction	Enabled (DF only) 4-943	Enabled (DF only) 4-943	Strong (DF only) 4-919-5
Scanner γ Correction	AE linear		As op panel 4-928-5
Small Smoothing Filter	Not used	Normal	Normal 4-921-4
Main Scan Magnification	Enabled		
Mirroring	Enabled only in the ADF mode		
MTF/Smoothing Filter	MTF (Weak)	MTF (Weakest)	MTF (Weakest) 4-915-35~48 4-916-35~48
Independent Dot Erase	Weak 4-944 (Enable/disable)		Weak 4-917-4
ID γ Correction	Photo priority	Text Priority	Text Priority 4-940-5
Gradation	Error diffusion		
Threshold	Constant		Constant 4-922-2 4-929-4
Independent Dot Erase (after image process)	None		
Line Width Correction	Disabled		Thicker Lines (strong) 4-935-5

Text/Photo Mode, Grayscale Processing

	Text/Photo Mode			
	Text Priority	**Normal**	**Photo Priority**	**Service Mode**
ADS (SBU)	As selected at the operation panel			As op panel 4-936-2
ADS (IPU)	As selected at the operation panel			As op panel 4-937-2 4-938-2
Shading Correction	Enabled			Enabled
White Line Correction	Enabled 4-942			Enabled 4-918-2
Black Line Correction	Enabled (DF only) 4-943			Strong (DF only) 4-919-2
Scanner γ Correction	AE linear			As op panel 4-928-2
Small Smoothing Filter	Normal			Normal 4-921-2
Main Scan Magnification	Enabled			
Mirroring	Enabled only in the ADF mode			
MTF/Smoothing Filter	MTF (Weak)	MTF (Weakest)		MTF (Weak) 4-915-11~22 4-916-11~22
Independent Dot Erase	Weak 4-944 (Enable/disable)			Weak 4-917-2
ID γ Correction	Text priority		Photo priority	Text priority 4-940-2
Gradation	Error diffusion			
Threshold	Constant			Constant 4-929-2
Independent Dot Erase (after image process)	None			
Line Width Correction	Disabled			Thick (Strong) 4-935-2

Photo Mode, Binary Picture Processing

	Photo Mode			
	Coarse print	**Press print**	**Glossy photo**	**Service Mode**
ADS (SBU)	As selected at the operation panel			As op panel 4-936-6
ADS (IPU)	As selected at the operation panel			As op panel 4-937-6 4-938-6
Shading Correction	Enabled			Enabled
White Line Correction	Enabled 4-942			Enabled 4-918-6
Black Line Correction	Enabled (DF only) 4-943			Strong (DF only) 4-919-6
Scanner γ Correction	NAE linear			As op panel 4-928-6
Small Smoothing Filter	Not used			
Main Scan Magnification	Enabled			
Mirroring	Enabled only in the ADF mode			
MTF/Smoothing Filter	Smoothing (Strong)		MTF (Weak)	Smoothing (Strong) 4-927-2
Independent Dot Erase	None			
ID γ Correction	Coarse print	Press print	Glossy photo	Press print 4-940-6
Gradation	Dither (53 lines)	Dither (105 lines)	Error diffusion	Dither (105 lines) 4-929-5
Threshold	--	--	Constant	--
Independent Dot Erase (after image process)	None			
Line Width Correction	Disabled			Disabled 4-935-6

Photo Mode, Grayscale Processing

	Photo Mode			
	Coarse print	**Press print**	**Glossy photo**	**Service Mode**
ADS (SBU)	As selected at the operation panel			As op panel 4-936-3
ADS (IPU)	As selected at the operation panel			As op panel 4-937-3 4-938-3
Shading Correction	Enabled			Enabled
White Line Correction	Enabled 4-942			Enabled 4-918-3
Black Line Correction	Enabled (DF only) 4-943			Strong (DF only) 4-919-3
Scanner γ Correction	NAE linear			As op panel 4-928-3
Small Smoothing Filter	Not used			
Main Scan Magnification	Enabled			
Mirroring	Enabled only in the ADF mode			
MTF/Smoothing Filter	Smoothing (Strong)	Smoothing (Medium)	MTF (Weakest)	Smoothing (Medium) 4-927-1
Independent Dot Erase	None			
ID γ Correction	Coarse print	Press print	Glossy photo	Press print 4-940-3
Gradation	Dither (105 lines)	Dither (143 lines)	Error diffusion	Dither (143 lines) 4-929-3
Threshold	--	--	Dynamic	--
Independent Dot Erase (after image process)	None			
Line Width Correction	Disabled			Disabled 4-935-3

Auto Shading

There are two auto shading methods. black level correction and white level correction. Auto shading corrects errors in the signal level for each pixel.

Black Level Correction

The CPU reads the black dummy data from one end of the CCD signal (32 pixels at the end are blacked off) and takes the average of the black dummy data. Then, the IPU deletes the black level value from each image pixel.

White Level Correction

Before scanning the original, the machine reads a reference waveform from the white plate. The average of the white video level for each pixel is stored as the white shading data in the FIFO memory in the IPU chip.

The video signal information for each pixel obtained during image scanning is corrected by the IPU chip.

Auto shading for the first original is done before the scanning.

After scanning every page, auto shading is done to prepare for the next page.

If the copy image density or the original mode is changed during copy run, the auto shading for the next scan is done before the scanning to respond to the mode changed.

White Line Erase Compensation

During the white level correction, if extremely low CCD output is detected in some parts of the line, the machine assumes this is due to abnormal black lines on the white plate. This low output is corrected using neighboring pixels. To switch off this correction, use SP4-918 (for the original modes known as “Service Mode”) and SP4-942 (other original modes).

Black Line Erase Compensation

In ADF mode, if extremely low CCD output is detected on the scanning line before the leading edge of original arrives there, this is attributed to abnormal black dots on the exposure glass. This low output is corrected using neighboring pixels. To adjust or switch off this correction, use SP4-919 (for the original modes known as “Service Mode”) and SP4-943 (other original modes).

Scanner Gamma (γ) Correction

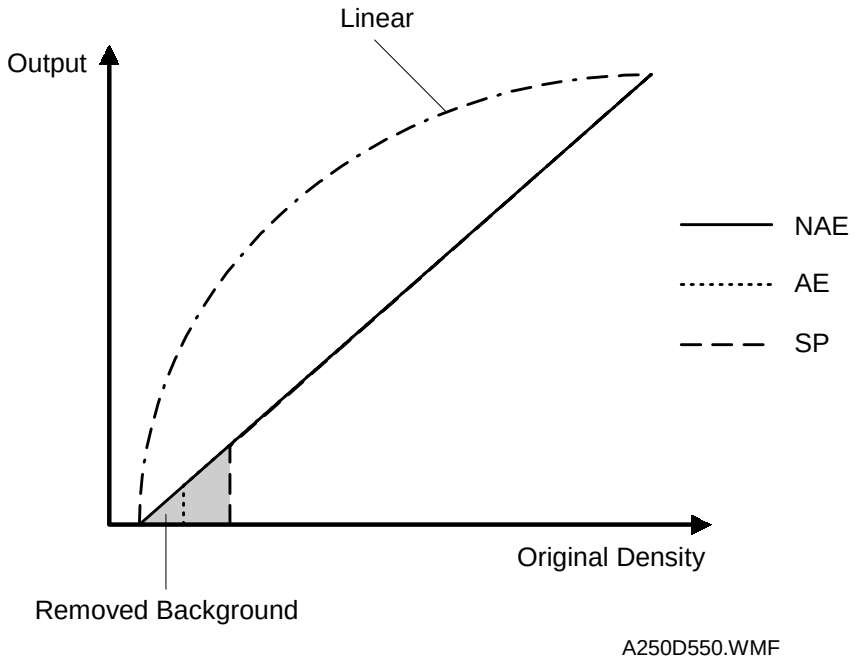
The CCD output is not proportional to the quantity of the light received. Scanner gamma (γ) correction corrects the CCD output so that grayscale data is proportion to the quantity of the light received.

The machine has four possible scanner gamma curves. The curve used by the machine depends on the original type selected by the user (at the operation panel and with 09. Image Mode Adjustment in the user tools). If the user selects one of the original modes known as 'service mode', the gamma curve can be selected with SP4-928.

If "0" is selected with SP 4-928, the scanner gamma curve is either AE or NAE, depending on the selected original mode (text, photo, etc.).

The four gamma (γ) correction curves and their characteristics are as follows:

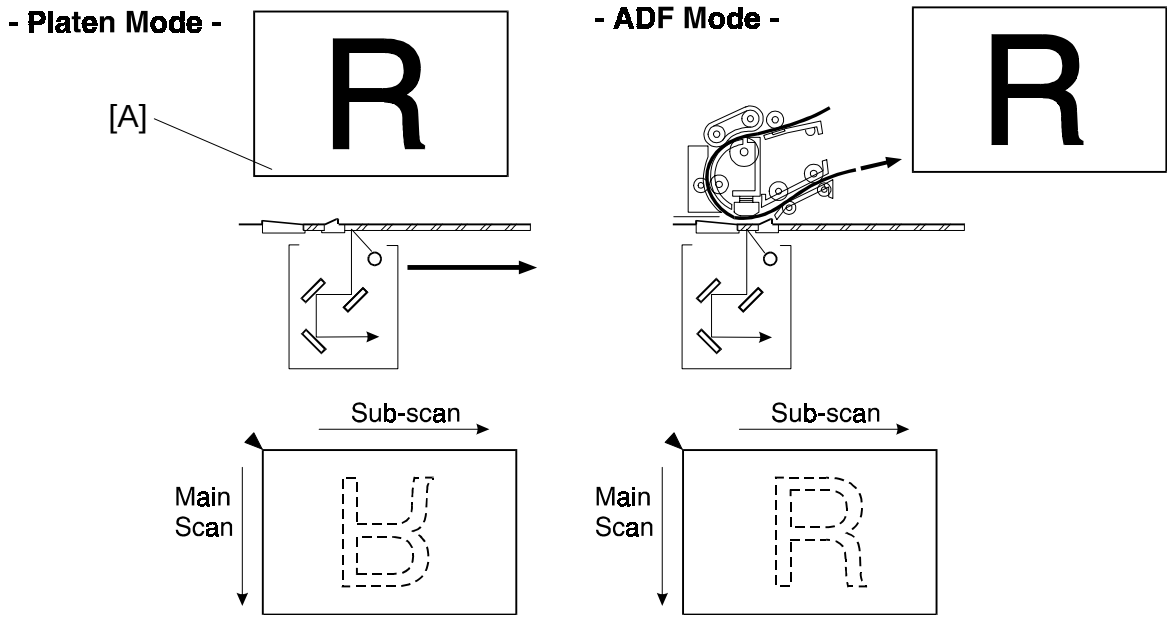
- Non Auto Exposure ID linear (NAE): Corrects the image data in proportion to the original density.
- Auto Exposure ID linear (AE): Removes the background from the image data to some extent and corrects the rest of the image data in proportion to the original density.
- Reflection Ratio ID Linear (Linear): Uses the image data without correction.
- Removed background (SP): Removes the background area completely and corrects the rest of the image data in proportion to the original density.



Main Scan Magnification/Reduction

Changing the scanner speed enables reduction and enlargement in the sub-scan direction. However, the IPU chip handles reduction and enlargement in the main scan direction. The processing for main scan magnification/reduction is the same as in the previous digital machines.

Mirroring for ADF Mode



A250D504.WMF

When making a copy using the ADF, the magnification circuit creates a mirror image. This is because the scanning starting position in the main scan direction is at the other end of the scan line in ADF mode (compared with platen mode). In platen mode, the original is placed face down on the exposure glass, and the corner at [A] is at the start of the main scan. The scanner moves down the page. In ADF mode, the ADF feeds the leading edge of the original to the DF exposure glass, and the opposite top corner of the original is at the main scan start position.

To create the mirror image, the IPU stores each line in a LIFO (Last In First Out) memory.

Filtering

Overview

There are some software filters for enhancing the desired image qualities of the selected original mode. These filters are the MTF filter, the smoothing filter, and independent dot erase.

The MTF filter emphasizes sharpness and is used in Text and Text/Photo modes.

The smoothing filter is used in Photo mode, except for Glossy Photo mode. In Glossy Photo mode, the MTF filter is used.

Independent dot erase removes unwanted dots from the image.

MTF Filter Adjustment - Text and Text/Photo Modes

When the user selects “Service Mode” for either Text or Text/Photo original type, the MTF filter strength and coefficient can be adjusted with SP4-915 and 4-916.

It is difficult to simply explain the relationships between the filter coefficient and filter strengths. Refer to the following charts to determine how to make the filters weaker or stronger. A circle indicates the default setting.

When the filter is stronger in the main scan direction, lines parallel to the feed direction are emphasized. When the filter is stronger in the sub-scan direction, lines at right angles to the feed direction are emphasized. A stronger MTF filter can make a low ID image visible but moiré may become more visible. Moiré is reduced using a smoothing filter specially designed for this purpose (see “Smoothing Filter Adjustment - Text/Photo”).

Grayscale Processing

MTF Filter \ Level	Weak ◄► Strong																															
Main Scan: Filter Coefficient	0	1	1	3	1	1	1	3	1	3	8	1	11	3	3	4	4	5	3	3	4	4	15	8	7	15	15					
Sub-Scan: Filter Coefficient	0	1	2	3	2	3	5	3	2	1	8	2	4	3	11	4	5	5	3	5	2	5	8	11	11	12	13					
Main Scan: Filter Strength	0	3	3	3	4	4	4	4	2	5	3	5	2	5	5	5	5	5	0	0	0	0	4	0	0	5	0					
Sub-Scan: Filter Strength	0	3	3	3	4	4	4	4	5	4	3	5	5	4	5	5	5	5	0	0	6	0	4	0	0	5	0					
Original Type																																
Text (25% to 29%) SP4-915-1, 6 SP4-916-1, 6												○																				
Text (30% to 76%) SP4-915-2, 7 SP4-916-2, 7												○																				
Text (77% to 154%) SP4-915-3, 8 SP4-916-3, 8														○																		
Text (155% to 256%) SP4-915-4, 9 SP4-916-4, 9														○																		
Text (257% to 400%) SP4-915-5, 10 SP4-916-5, 10																							○									
Text/Photo (25% to 57%) SP4-915-11, 17 SP4-916-11, 17								○																								
Text/Photo (58% to 29%) SP4-915-12, 18 SP4-916-12, 18														○																		
Text/Photo (30% to 76%) SP4-915-13, 19 SP4-916-13, 19								○																								
Text/Photo (77% to 154%) SP4-915-14, 20 SP4-916-14, 20								○																								
Text/Photo (155% to 256%) SP4-915-15, 21 SP4-916-15, 21								○																								
Text/Photo (257% to 400%) SP4-915-16, 22 SP4-916-16, 22								○																								

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Binary Picture Processing

MTF Filter \ Level	Weak → Strong																															
Main Scan: Filter Coefficient	0	1	1	3	1	1	1	3	2	3	1	3	8	1	11	3	3	4	4	5	3	3	4	4	15	8	7	15	15			
Sub-Scan: Filter Coefficient	0	1	2	3	2	3	5	3	3	2	5	4	3	5	2	4	3	11	2	4	5	3	5	5	8	11	11	12	13			
Main Scan: Filter Strength	0	3	3	3	4	4	4	4	4	3	5	4	3	5	5	5	5	5	5	5	5	0	0	0	12	4	0	0	5	0		
Sub-Scan: Filter Strength	0	3	3	3	4	4	4	4	5	4	4	3	5	5	5	4	5	5	5	5	5	0	0	6	0	4	0	0	5	0		
Original Type																																
Text (25% to 49%) SP4-915-23, 29 SP4-916-23, 29					○																											
Text (50% to 95%) SP4-915-24, 30 SP4-916-24, 30					○																											
Text (96% to 125%) SP4-915-25, 31 SP4-916-25, 31													○																			
Text (126% to 159%) SP4-915-26, 32 SP4-916-26, 32															○																	
Text (160% to 200%) SP4-915-27, 33 SP4-916-27, 33																			○													
Text (201% to 400%) SP4-915-28, 34 SP4-916-28, 34																			○													
Text/Photo (25% to 49%) SP4-915-35, 42 SP4-916-35, 42						○																										
Text/Photo (50% to 89%) SP4-915-36, 43 SP4-916-36, 43						○																										
Text/Photo (90% to 95%) SP4-915-37, 44 SP4-916-37, 44						○																										
Text/Photo (96% to 125%) SP4-915-38, 45 SP4-916-38, 45														○																		
Text/Photo (126% to 159%) SP4-915-39, 46 SP4-916-39, 46														○																		
Text/Photo (160% to 200%) SP4-915-40, 47 SP4-916-40, 47														○																		
Text/Photo (201% to 400%) SP4-915-41, 48 SP4-916-41, 48														○																		

A265D511.WMF

Smoothing Filter Adjustment - Photo Mode

When the user selects “Service Mode” for Photo original type, the smoothing filter can be changed with SP4-927. A stronger smoothing filter makes the image more blurred (1: Weak ~ 8: Strong).

Smoothing Filter Adjustment - Text and Text/Photo Modes

To reduce the possibility of moiré, a small-matrix smoothing filter is used after scanner gamma (γ) correction in the Text and Text/Photo mode.

This is only used when the user selects “Service Mode” for either Text or Text/Photo original type. The level of smoothing can be adjusted with SP4-921.

Independent Dot Erase

In Text mode and in Text/Photo mode, independent dots are detected using a 7 x 9 matrix and erased from the image.

The independent dot detection level can be adjusted with SP4-917 (for the original modes known as “Service Mode”) and SP4-944 (other original modes – on/off only; no adjustment). With a larger SP setting, more dots are detected as independent dots and erased, even if the dot's density is high. However, dots in mesh-like images may be detected as independent dots mistakenly.

Independent Dot Erase after Binary Picture Processing

Normally, independent dot erase is done in the filtering stage. However, when the user selects “Service Mode” for Text original type, independent dots may reappear in the image after the binary picture processing. These independent dots are erased after gradation processing.

SP4-939 changes the filter that is used for this process, and it can be also used to disable this feature. A smaller matrix is more likely to remove dots.

ID Gamma (γ) Correction

The machine automatically selects the most appropriate ID gamma correction based on the selected original type (and the user tool Image Adjustment setting) and ID setting made at the operation panel.

When the user selects “Service Mode” for any original type, you can use SP4-940 to change ID correction in service mode. The types that can be selected with SP4-940 are different for each original mode (Text, Text/Photo, or Photo).

Gradation Processing

Overview

There are four types of gradation processing. Refer to the “Default Image Processing Mode for Each Original Type” section for more details on which processes are used for each original mode.

- Grayscale processing: This has 4 output levels for each pixel.
- Binary picture processing: This has only two output levels (black and white).
- Error diffusion: This is used with either grayscale processing or binary picture processing mode.
- Dithering: This is used with either grayscale processing or binary picture processing mode.

Grayscale Processing

In this machine, the 8-bit image data is converted into 2-bit data. This produces up to 4 image density levels for each pixel.

To realize this, this machine uses a form of pulse width modulation. In this machine, pulse width modulation consists of the following processes:

- Laser diode pulse positioning
- Laser diode power/pulse width modulation

Laser diode power and pulse width modulation is done by the laser diode drive board (LDD). Briefly, the width of the laser pulse for a pixel depends on the output level (image density level: from 0 to 255) required for the pixel.

This machine can also change the laser pulse position (at the left side of the pixel, at the center, or at the right side) automatically, depending on the location of the image pixel so that the edges of characters and lines become clearer. There is no SP mode adjustment for this, unlike in some earlier models.

Note that although the LDD can create 256 levels per pixel, the machine only uses 16 of these, and only four are used for any one job. A gamma table determines which four output levels are used. The gamma table is different for each original type setting.

Binary Picture Processing

The 8-bit image data is converted into 1-bit data (black and white image data).

Constant and Dynamic Thresholding

There are two types of threshold:

- Constant threshold: The threshold is fixed
- Dynamic threshold: The threshold value for each pixel depends on the surrounding pixels.

The type that is used depends on the selected original type (text, text/photo, photo) and user tool Image Mode Adjustment setting.

However, if the user selects “Service Mode” for either Text or Text/Photo original type (User Tools - General Features - 09. Image Mode Adjustment), the thresholding type can be changed with SP4-922, but only for binary picture processing.

- Constant threshold value -

The threshold remains the same all the time.

The threshold can be adjusted with SP 4-923 when the user selects “Service Mode” for the Text original type, but only for binary picture processing.

Decreasing the threshold value creates a darker image.

- Dynamic threshold value -

Dynamic thresholding is designed to clearly separate text/vector graphic objects from the background. It prevents low contrast text from disappearing.

The software compares each pixel with the pixels immediately surrounding it. It is tested in four directions: horizontal, vertical, and in the two diagonal directions. If the image density difference between the object pixel and the surrounding pixels is more than a certain value in any one of these directions, the pixel is determined to be on an edge.

Pixels on the edge are treated with dynamic thresholding. The threshold is calculated by averaging the densities of pixels in the surrounding 7 x 7 area. However, the calculated threshold cannot exceed maximum and minimum limits; if it does, the upper or lower limit is used.

Pixels that are not on an edge are treated with a constant threshold value.

As a side-effect of the dynamic threshold process, copies of originals where the rear side is visible through the paper or the background is dark, may tend to have dirty background. In this case it is necessary to adjust the image density level with the image density key on the operation panel. These adjustments are only for binary picture processing mode.

- Edge detection: SP4-931 (vertical direction), 4-932 (horizontal direction), 4-933 (diagonal from top right to bottom left), 4-934 (diagonal from top left to bottom right). Decreasing the SP mode value causes a lighter line to be detected as an edge.
- Threshold limits for edges, and the threshold for non-edge pixels: SP4-924 (Max), 4-925 (Min), and 4-926 (Center, used for non-edge pixels). The closer that the upper or lower limit is adjusted to the center threshold, the fewer stains appear. However, a low ID contrast image cannot be copied.

Error Diffusion

The error diffusion process reduces the difference in contrast between light and dark areas of a halftone image. Each pixel is corrected using the difference between it and the surrounding pixels. The corrected pixels are compared with an error diffusion matrix.

If the user selects “Service Mode” for Text (greyscale mode) or Text/Photo (greyscale or binary picture mode) and the thresholding type is changed from constant to dynamic, an error diffusion matrix can be selected with SP4-929-1 (No.1: 4 x 4 matrix and No.2: 8 x 8 matrix). The two selections are prepared for future use to match original types which are not supported currently. Therefore, at this moment SP4-929-1 should not be used.

Error diffusion cannot be selected in Photo mode.

Dithering

Each pixel is compared with the pixel in the same position in a dither matrix. Several matrixes are available, to increase or decrease the detail on the copy. If the user selects “Service Mode” for Photo original type, the dither matrix can be selected with SP4-929-3 and SP4-929-5. A larger value for this SP mode increases the number of gradations. However, the image will not have much contrast.

Line width correction

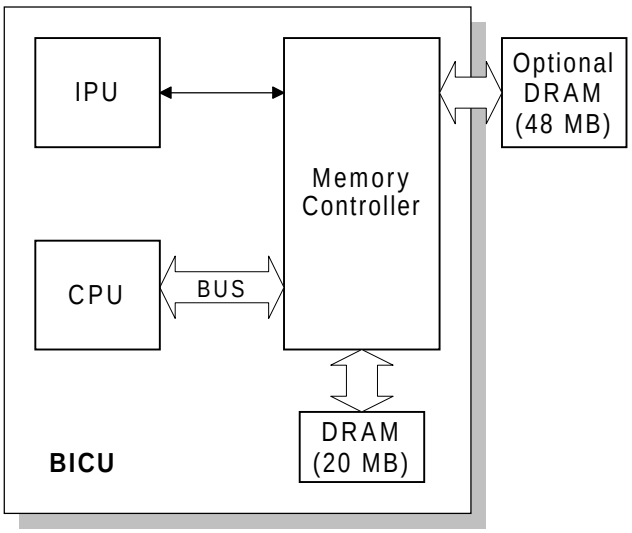
This function is effective only in pale mode and copied original mode (these are original types for Text mode with greyscale).

Usually, lines will bulge in the main scan direction as a result of the negative/positive development system that is used in this model. So, pixels on edges between black and white areas are compared with adjacent pixels, and if the pixel is on a line, the line thickness will be reduced.

The line width correction is done in the IPU chip.

The line width correction type can be selected with SP4-935.

2.2.5 MEMORY CONTROLLER AND ENHANCED MEMORY BOARD (EMB)



A265D515.WMF

The BICU consists of the memory controller and the DRAM. The functions of each device are as follows.

Memory Controller: Compressing the 1-bit image data and 2-bit image data
Image rotation
Image data transfer to the DRAM

DRAM (standard 20MB): Stores the compressed data
Working area

The data goes to the memory controller after binary picture processing or grayscale processing. The data is first compressed and then stored in the DRAM. For printing, the data from the DRAM goes back to the memory controller, where it is decompressed and image editing is done (e.g., image rotation, repeat image).

The memory capacity changes after installing optional memory on the BICU board, as follows.

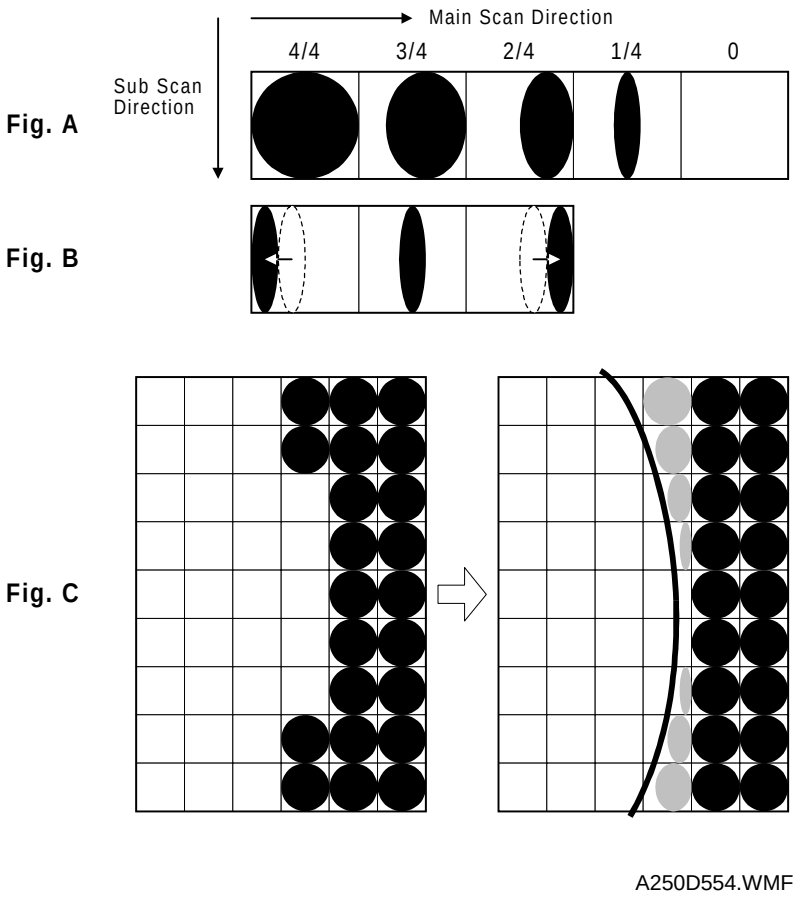
		Standard (20 MB)	20 MB + Optional (68 MB total)
Binary picture processing	A4 6%	88	99
	ITU-T#4 (12% black)	32	99
Grayscale processing	A4 6%	Not available	99
	ITU-T#4 (12% black)	Not available	52

[A4 size, Text mode (Number of pages)]

2.2.6 VIDEO CONTROL UNIT (VCU)

Fine Character and Image (FCI)

The FCI performs image smoothing. This functions only affects binary picture processed images in sharp text mode.



A250D554.WMF

Usually, binary picture processing generates jagged edges on characters, as shown in the above illustration. These are reduced using edge smoothing. The FCI changes the laser pulse duration and position for certain pixels.

Fig. A shows the four possible pulse durations, and Fig. B shows how the laser pulse can be in one of three positions within the pixel. Fig. C shows an example of how edge smoothing is used.

SP2-902 switches FCI smoothing on or off, but is only valid for copy mode.

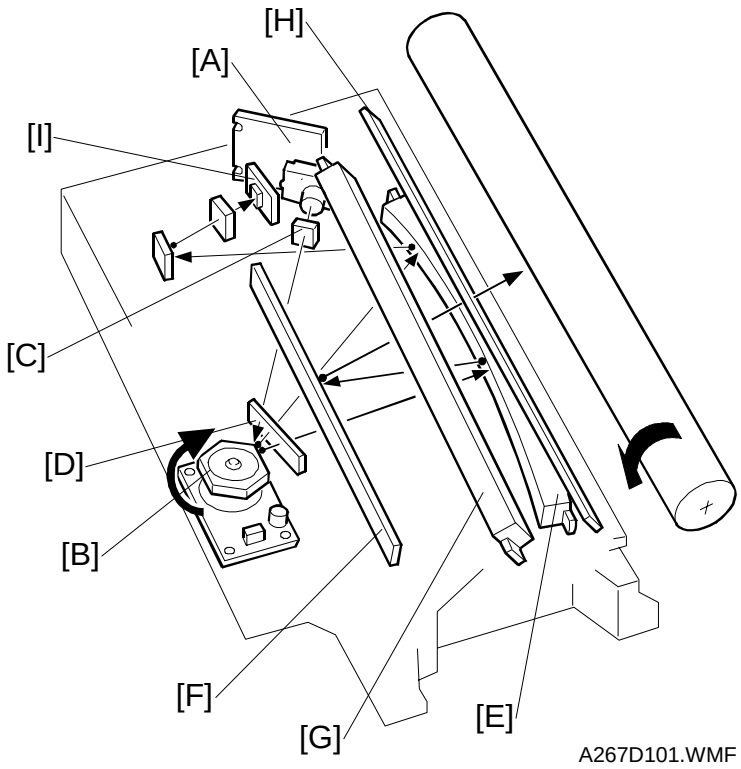
Printer Gamma Correction

Printer correction corrects the data output from the IPU to the laser diode to account for the characteristics of the printer (e.g., the characteristics of the drum, laser diode, and lenses).

The machine chooses the most suitable gamma curve for the original type selected by the user. There is no SP adjustment for this.

2.3 LASER EXPOSURE

2.3.1 OVERVIEW



The optical path from the laser diode to the drum is shown above.

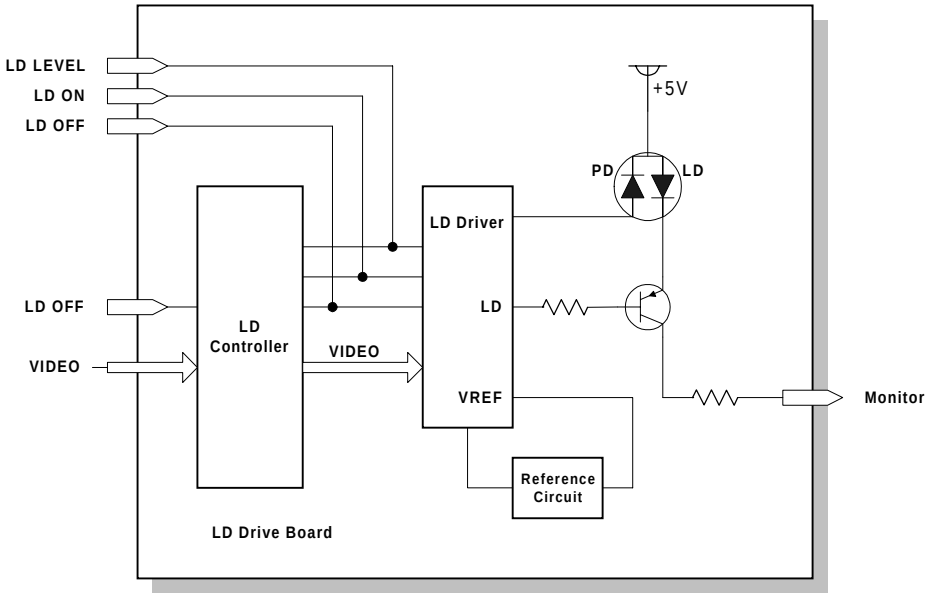
The LD unit [A] outputs a laser beam to the polygon mirror [B] through the cylindrical lens [C]. The shield glass [D] prevents dust from reaching the polygon mirror.

Each surface of the polygon mirror reflects one full main scan line. The laser beam goes to the F-theta mirror [E], mirror [F], and BTL (barrel toroidal lens) [G]. Then the laser beam goes to the drum through the toner shield glass [H].

The laser synchronizing detector [I] determines the main scan starting position.

The speed of the polygon mirror motor is 28,818.9 rpm for 600 dpi.

2.3.2 AUTO POWER CONTROL (APC)



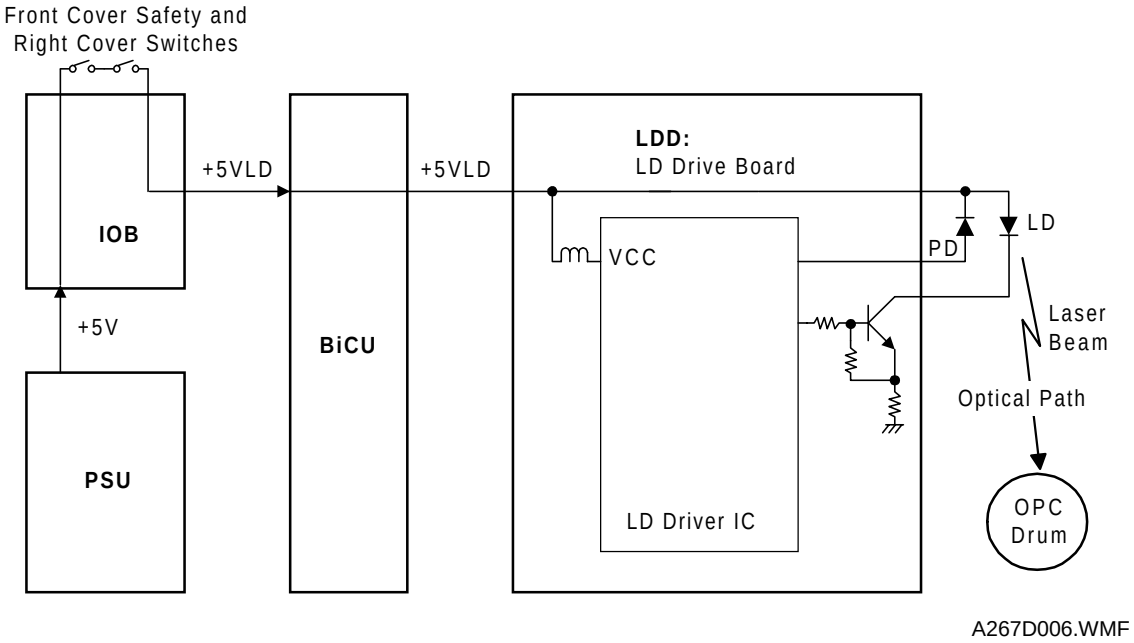
A267D510.WMF

The LD driver IC drives the laser diode. To prevent the intensity of the laser beam from changing because of the temperature, the machine monitors the current passing through the laser diode (LD). The machine adjusts the current to the laser diode by comparing it with the reference level from the reference circuit.
This auto power control is done just after the machine is turned on and during printing while the laser diode is active.

The laser diode power is adjusted on the production line.

NOTE: Do not touch the variable resistors on the LD unit in the field.

2.3.3 LD SAFETY SWITCH



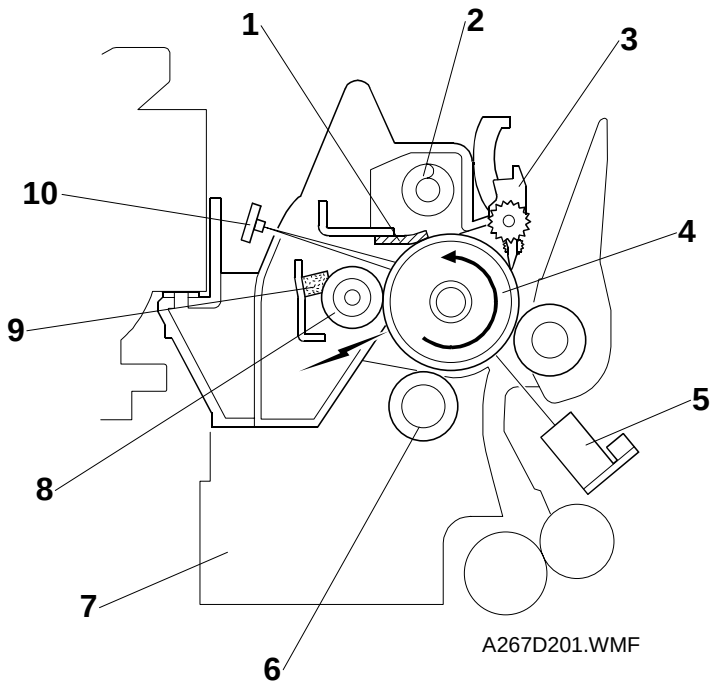
A267D006.WMF

To ensure technician and user safety and to prevent the laser beam from inadvertently switching on during servicing, safety switches are located at the front and right covers. The switches are installed on the +5VLD line coming from the power supply unit through the IOB and BICU boards.

When the front cover or the right cover is opened, the power supply to the laser diode is interrupted.

2.4 PHOTOCONDUCTOR UNIT (PCU)

2.4.1 OVERVIEW



The PCU consists of the components shown in the above illustration. An organic photoconductor (OPC) drum (diameter: 30 mm) is used in this machine.

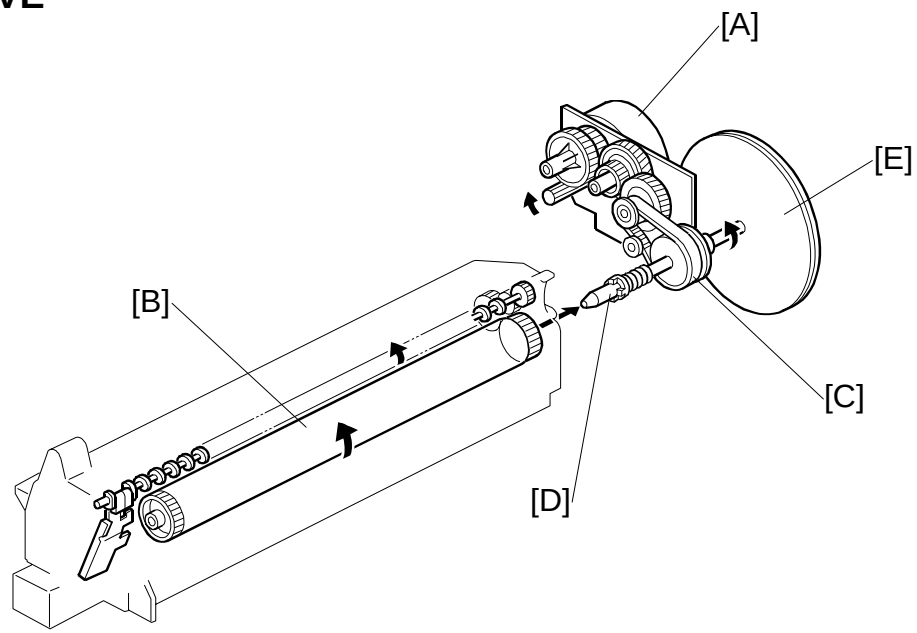
1. Cleaning Blade
2. Toner Collection Coil
3. Pick-off Pawl
4. OPC Drum
5. ID Sensor (see note)
6. Development Roller
7. Development Unit
8. Charge Roller
9. Charge Roller Cleaning Pad
10. Quenching Lamp (see note)

NOTE: These parts are not included in the PCU.

The machine informs the user when the PCU life has finished. However, the user can continue to make copies.

SP5-912 can be used to enable or disable this warning message, and to change the default replacement interval (the default is 60k).

2.4.2 DRIVE

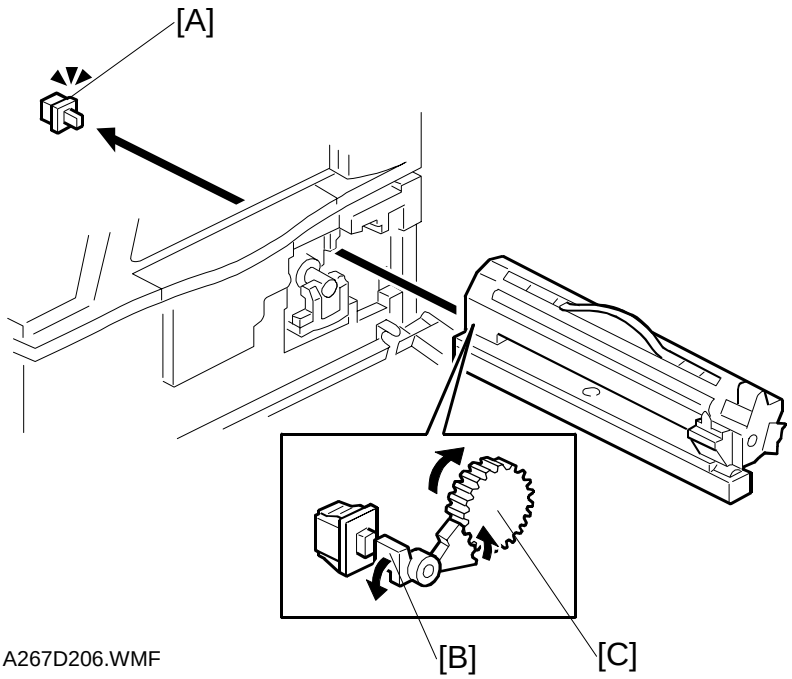


A267D202.WMF

The main motor [A] drives the drum [B] through a series of gears, a timing belt [C], and the drum drive shaft [D]. The main motor assembly includes a drive controller, which outputs a motor lock signal when the rotation speed is out of the specified range.

The fly-wheel [E] on the end of the drum drive shaft stabilizes the rotation speed (this prevents banding and jitter from appearing on copies).

2.4.3 NEW PCU DETECTION



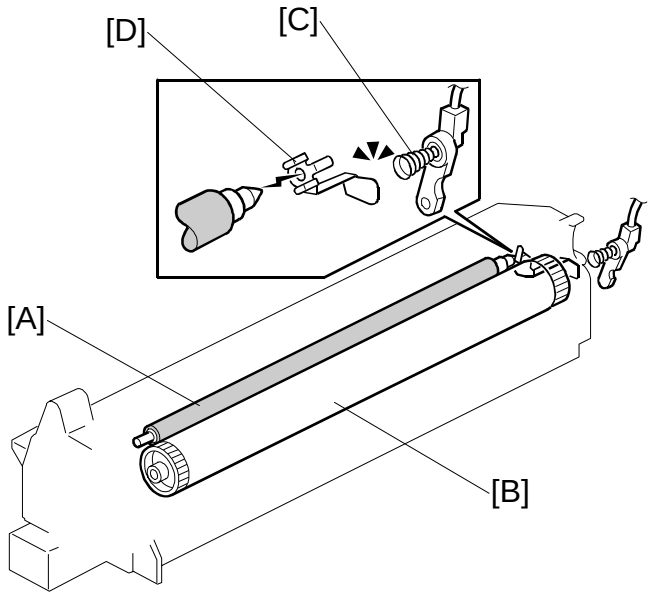
The new PCU detect switch [A] detects when a new PCU is installed. Each PCU has an actuator [B]. When a new PCU is installed in the machine, the actuator [B] pushes the new PCU detect switch. The actuator is a sector gear, and this gear engages with the drum gear [C]. When the drum rotates, the actuator is released from the drum gear. The actuator drops away from the new PCU detect switch and remains in this "down" position for the duration of the PCU's life.

The machine recognizes when a new PCU has been installed in the machine because the actuator of the new PCU contacts the new PCU detect switch. After the front cover and right cover are closed, the machine then performs the TD sensor initial setting procedure automatically (for about 45 seconds). During this time, the drum rotates and the actuator drops away from the sensor.

Also, while the machine performs the TD sensor initial setting, the machine makes a ID sensor pattern on the drum. This checks whether the developer has fallen into the development unit (in other words, it checks whether the technician remembered to remove the developer seal from the PCU at machine installation). If the machine does not detect the ID sensor pattern, SC 392 will be generated.

2.5 DRUM CHARGE

2.5.1 OVERVIEW



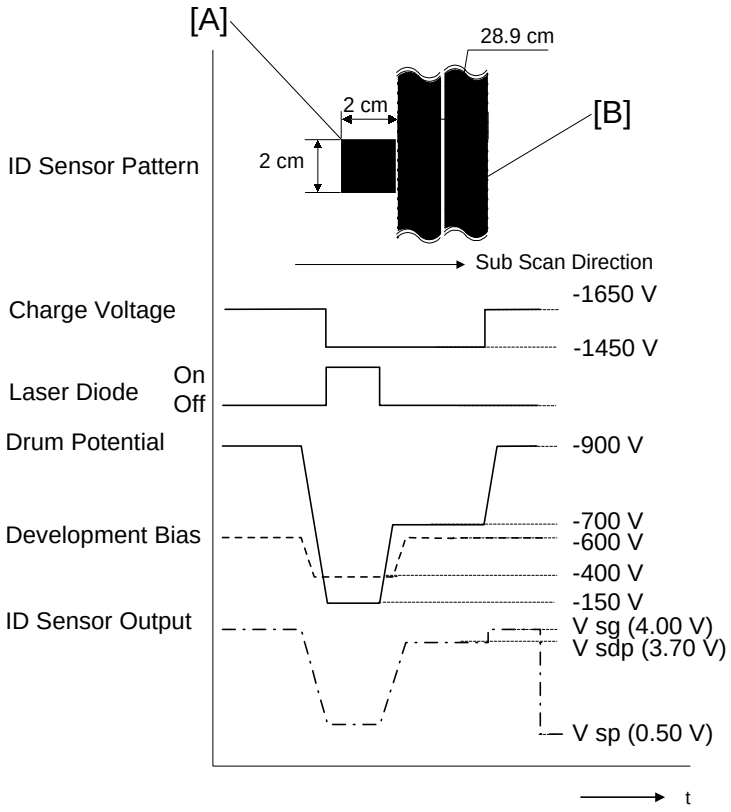
A267D203.WMF

This copier uses a drum charge roller to charge the drum. The drum charge roller [A] always contacts the surface of the drum [B] to give it a negative charge of –900V.

The high voltage supply board gives a negative dc voltage to the drum charge roller through the spring [C] and terminal plate [D].

2.5.1 CHARGE ROLLER VOLTAGE CORRECTION

Correction for Environmental Conditions



A265D516.WMF

With a drum charge roller system, the voltage transferred from roller to drum varies with the temperature and humidity around the drum charge roller. The lower the temperature or humidity is, the higher the applied voltage required.

To compensate, the machine uses the ID sensor to measure the effects of current environmental conditions. For this measurement, the process control parameters are balanced so that any small change in drum potential caused by environmental effects is reflected in a change in the amount of toner transferred to the drum.

This measurement is made immediately after the ID sensor pattern for toner density control. Immediately after making ID sensor pattern [A], the charge roller voltage stays on, but the development bias goes up to -600V; as a result the drum potential is reduced to -700V. The laser diode is not switched on, and the drum potential is now slightly higher than the development bias, so only a very small amount of toner transfers to the drum. The ID sensor measures the density of this pattern [B], and the output voltage is known as Vsdp. This voltage is compared with Vsg (read from the bare drum at the same time).

If the humidity drops, the drum potential goes up (to a higher –ve voltage) even if the charge roller voltage supply stays the same (efficiency of voltage transfer is higher with lower humidity). As a result, less toner is transferred to ID sensor pattern [B]. If the sensor output reaches a certain point, the drum charge voltage will be reduced.

To determine whether to change the drum charge roller voltage, the machine compares Vsdp with Vsg.

- Vsdp / Vsg > 0.95 = Reduce the magnitude of the drum charge voltage by 50 V
- Vsdp / Vsg < 0.90 = Increase the magnitude of the drum charge voltage by 50 V

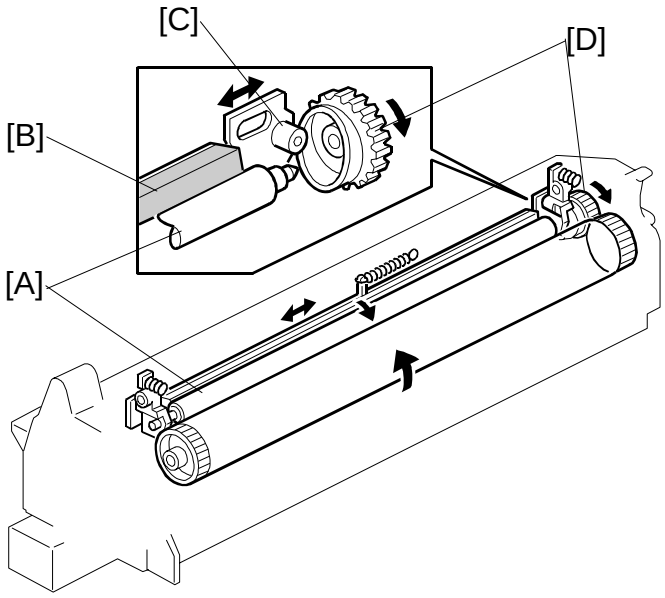
2.5.2 ID SENSOR PATTERN PRODUCTION TIMING

The ID sensor pattern is not made every page or every job. It is only made in the following conditions:

- During warming up at power on
- If the machine starts warming up after a certain time (default: 30 minutes) has passed since entering night mode or low power mode

The 30-minute interval can be changed using SP2-995.

2.5.3 DRUM CHARGE ROLLER CLEANING



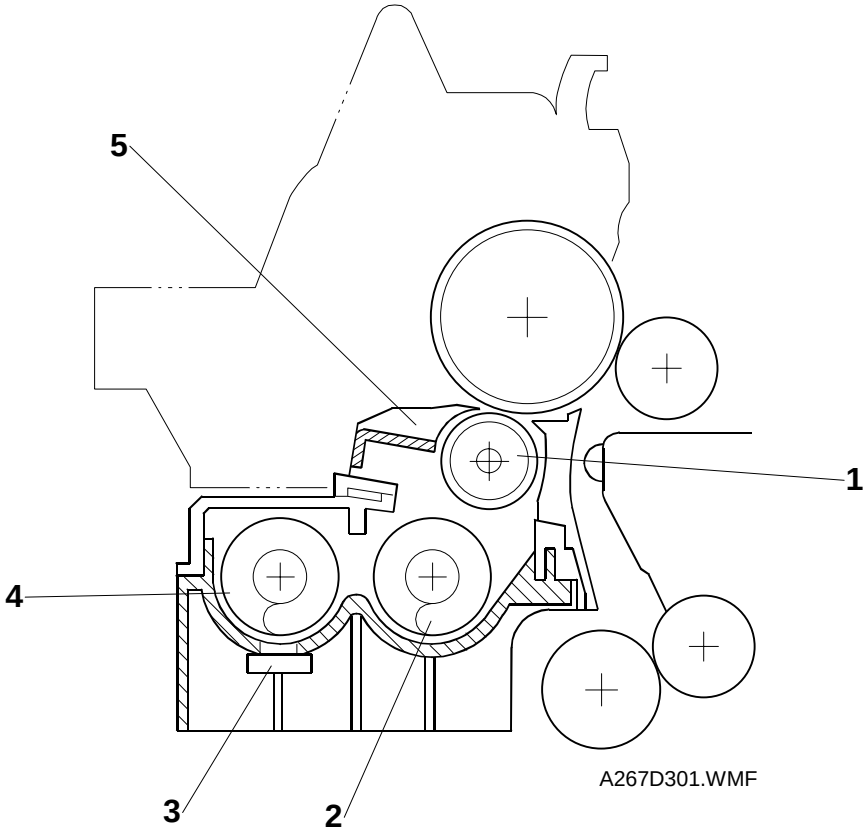
A267D204.WMF

Because the drum charge roller [A] always contacts the drum, it gets dirty easily. So, the cleaning pad [B] also contacts the drum charge roller all the time to clean the surface of the drum charge roller.

The pin [C] at the rear of the cleaning pad holder touches the cam gear [D], and this gear moves the cleaning pad from side to side. This movement improves the cleaning.

2.6 DEVELOPMENT

2.6.1 OVERVIEW

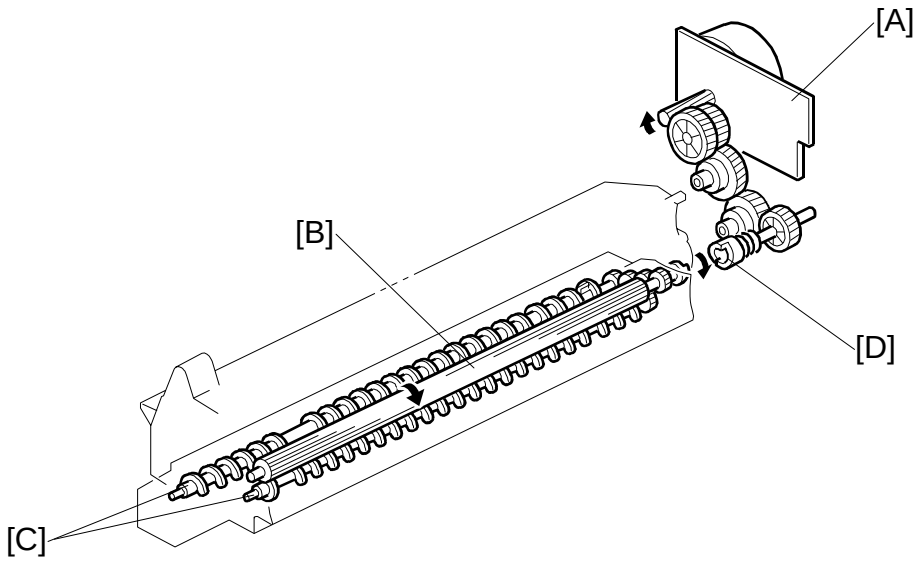


The development unit consists of the following parts.

1. Development roller
2. Mixing auger 2
3. TD sensor
4. Mixing auger 1
5. Doctor blade

This machine uses a single-roller development system. Two mixing augers mix the developer. The toner density (TD) sensor and image density (ID) sensor (see the illustration in the PCU section) are used to control toner density.

2.6.2 DRIVE

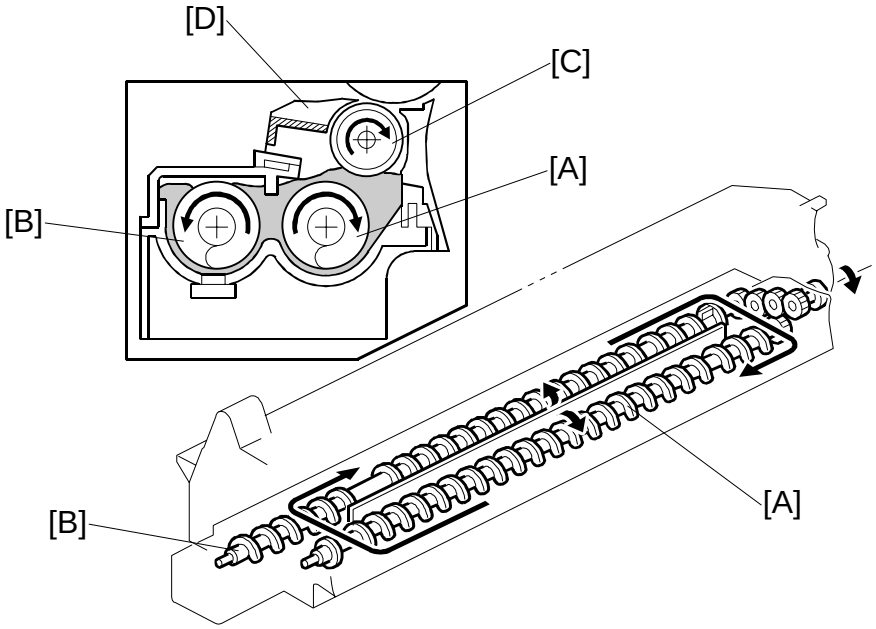


A267D304.WMF

The main motor [A] drives the development roller [B] and mixing augers [C] through a train of gears and the development drive shaft [D]. When the PCU is pushed in, the development drive shaft engages the development roller gear.

The development drive gears (except for the gears in the development unit) are helical gears. These gears are quieter than normal gears.

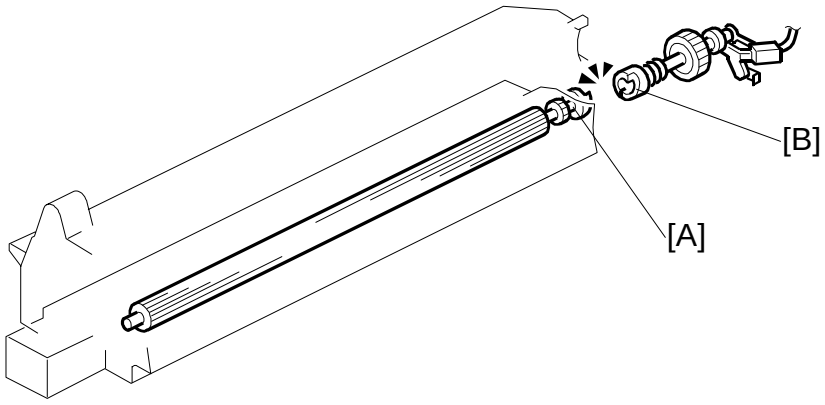
2.6.3 DEVELOPER MIXING



A267D302.WMF

This copier uses 2 mixing augers, [A] and [B], to keep the developer evenly mixed. Mixing auger 2 [A] transports excess developer, scraped off the development roller [C] by the doctor blade [D], towards the front of the machine. Mixing auger 1 [B] returns the excess developer, along with new toner, to the rear of the mixing assembly. Here the developer is reapplied to the development roller.

2.6.4 DEVELOPMENT BIAS



A267D303.WMF

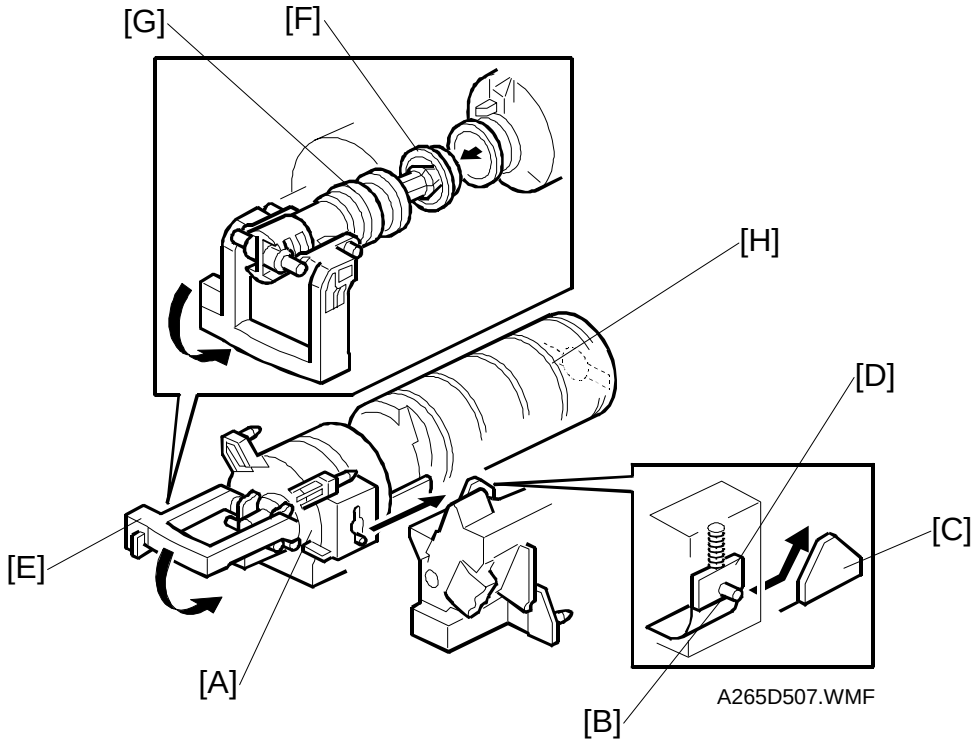
This machine uses a negative-positive development system, in which black areas of the latent image are at a low negative charge (about –150 ± 50 V) and white areas are at a high negative charge (about -900 V).

To attract negatively charged toner to the black areas of the latent image on the drum, the high voltage supply board applies a bias of -600 volts to the development rollers throughout the image development process. The bias is applied to the development roller shaft [A] through the drive shaft [B].

The development bias voltage (-600 V) can be adjusted with SP2-201-1.

2.6.5 TONER SUPPLY

Toner bottle replenishment mechanism



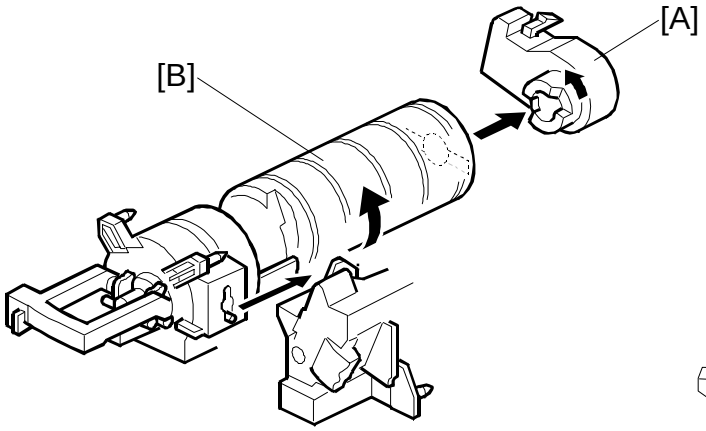
When a toner bottle is placed in the bottle holder unit [A] and the unit is pushed in completely, pin [B] moves against the side [C] of the PCU, and the toner shutter [D] is pulled out to open the bottle. When the toner bottle holder lever [E] is put back in the original position, the cap [F] on the toner bottle is pulled away and kept in place by the chuck [G].

The toner supply mechanism transports toner from the bottle to the development unit. The toner bottle has a spiral groove [H] that helps move toner to the development unit.

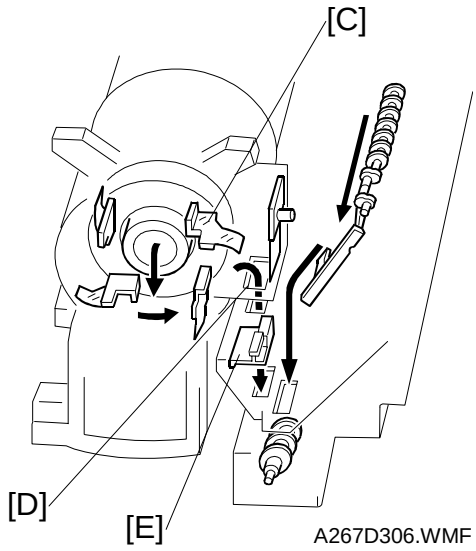
When the bottle holder unit is pulled out to add a new toner bottle, the following happens automatically to prevent toner from scattering.

- The chuck releases the toner bottle cap into its proper position.
- The toner shutter shuts to block the opening as a result of pressure from a spring.

Toner supply mechanism



A265D508.WMF



A267D306.WMF

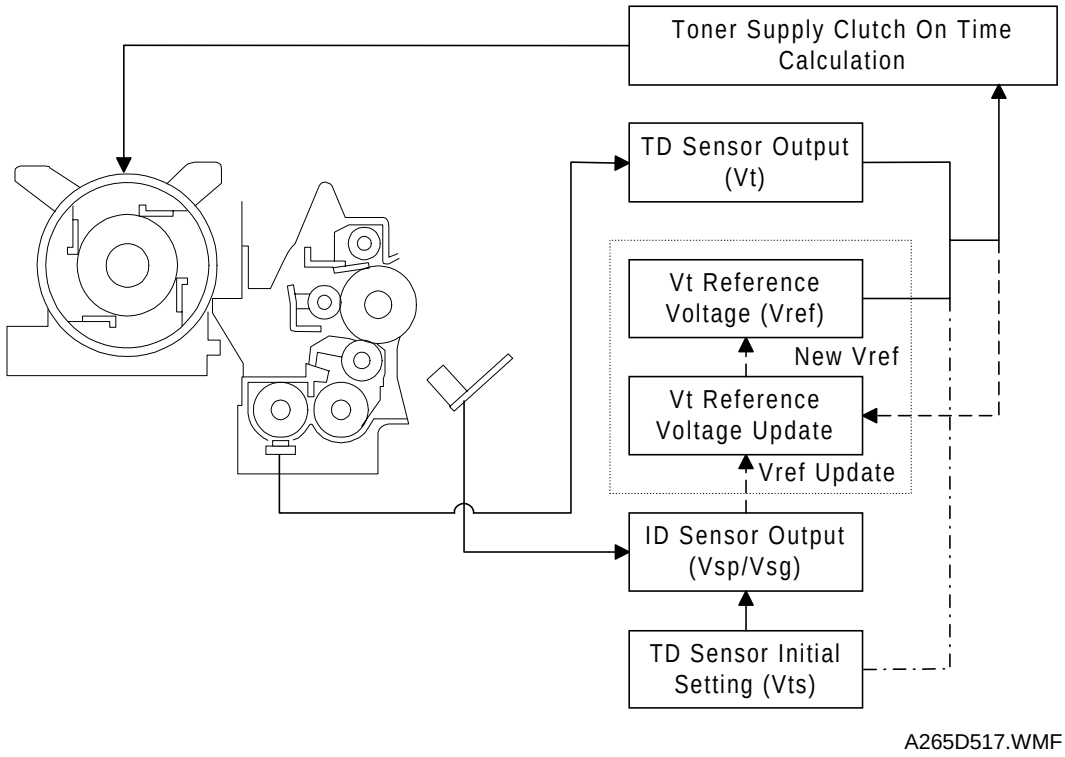
The toner supply motor [A] drives the toner bottle [B] and the mylar blades [C]. First, the toner falls down into the toner bottle holder. The toner supply mylar blades transfer the toner to the slit [D]. When the PCU is installed in the machine, the shutter [E] above the PCU is opened by the machine frame. Then the toner falls down into the development unit through the slit and the shutter.

2.6.6 TONER DENSITY CONTROL

Overview

There are four modes for controlling toner supply as shown in the following tables. The mode can be changed with by SP2-921. The factory setting is sensor control 1 mode.

Basically, toner density is controlled using the standard TD sensor voltage (Vts), toner supply reference voltage (Vref), actual TD sensor output voltage (Vt), and ID sensor output data (Vsp/Vsg).



A265D517.WMF

There are four toner density control modes as follows.

Mode	Sensor control 1 (SP2-921, “0”): Normally use this setting only
Toner supply decision	Compare Vt with a reference voltage (Vts or Vref)
Toner control process	Toner is supplied to the development unit when Vt is higher than the reference voltage (Vts or Vref). This mode keeps the Vref value for use the next toner density control. Vts is used for the first toner density control after a new PCU has been installed, until it has been corrected with the ID sensor output. Vref is used after Vts has been corrected with the ID sensor output voltage (corrected during the first toner density control for a new PCU).
Toner supply amount	Varies
Toner end detection	Performed

Mode	Sensor control 2 (SP2-921, “1”): For designer’s use only; do not use in the field
Toner supply decision	Compare Vt with a reference voltage (Vts)
Toner control process	This toner control process is the same as sensor control 1 mode. However, the reference voltage used is always Vts.
Toner supply amount	Varies
Toner end detection	Performed

Mode	Fixed control 1 (SP2-921, “2”): For designer’s use only; do not use in the field
Toner supply decision	Compare Vt with a reference voltage (Vts or Vref)
Toner control process	This toner control process is the same as sensor control 1 mode.
Toner supply amount	Fixed (SP2-925)
Toner end detection	Performed

Mode	Fixed control 2 (SP2-921, “3”): Use temporarily if the TD sensor needs to be replaced
Toner supply decision	None
Toner control process	Toner is supplied every printed page regardless of Vt.
Toner supply amount	Fixed (SP2-925)
Toner end detection	Not performed

Toner density sensor initial setting

The TD sensor initial setting procedure is performed automatically when the new PCU is installed in the machine. During TD sensor initial setting, the TD sensor is set so that the TD sensor output to the value of SP2-926 (default: 2.3V). This value will be used as the standard reference voltage (Vts) of the TD sensor.

Toner density measurement

Toner density in the developer is detected once every copy cycle. The sensor output voltage (Vt) during the detection cycle is compared with the standard reference voltage (Vts) or the toner supply reference voltage (Vref).

Vsp/Vsg detection

The ID sensor detects the following voltages.

- Vsg: The ID sensor output when checking the drum surface
- Vsp: The ID sensor output when checking the ID sensor pattern

In this way, the reflectivity of both the drum surface and the pattern on the drum are checked. This compensates for any variations in the reflectivity of the pattern on the drum or the reflectivity of the drum surface.

The ID sensor pattern is made on the drum by charge roller and laser diode.

Vsp/Vsg is not detected every page or job; it is detected at the following times to decide Vref.

- During warming up at power on
- If the machine starts warming up after a certain time (default: 30 minutes) has passed since entering night mode or low power mode

The 30-minute interval can be changed using SP2-995.

Toner supply reference voltage (Vref) determination

The toner supply reference voltage (Vref) is the threshold voltage for the toner supply determination. Vref is determined using the following data:

- ID sensor output (Vsp/Vsg)
- (Vts or the current Vref) - Vt

Toner supply determination

The reference voltage (Vts or Vref) is the threshold voltage for determining whether or not to supply toner. If Vt becomes greater than the reference voltage, the machine supplies additional toner.

Toner Supply Motor On Time Determinations

For fixed control mode, the toner supply motor on time is specified by the setting of SP2-925, and does not vary. The default setting is 200 ms for each copy. The toner supply motor on time for each value of SP2-925 is as follows.

Value of SP2-925	Motor On Time (t = 200 ms)
0	t
1	2t
2	4t
3	8t
4	12t
5	16t
6	Continuously
7	Not supplied

For sensor control modes 1 and 2, the toner supply motor on time is decided by the following factors.

- Vt
- Vref or Vts
- TD sensor sensitivity (coefficient: S, value is 0.4)

There are seven levels for toner supply motor on time as shown below.

Level	Decision	Motor On Time (seconds)
1	(Vts or Vref) < Vt ≤ (Vts or Vref) + S/16	t (0.6)
2	(Vts or Vref) < Vt ≤ (Vts or Vref) + S/8	t x 2 (1.2)
3	(Vts or Vref) < Vt ≤ (Vts or Vref) + S/4	t x 4 (2.4)
4	(Vts or Vref) < Vt ≤ (Vts or Vref) + S/2	t x 8 (4.8)
5	(Vts or Vref) < Vt ≤ (Vts or Vref) + 4S/5	t x 16 (9.6)
6	Vt ≥ (Vts or Vref) + 4S/16 (near-end)	T (30); see note 3
7	Vt ≥ (Vts or Vref) + S (toner end)	T (30); see note 3

NOTE: 1) The value of “t” can be changed using SP2-922 (default: 0.6 second)
2) The value of “T” can be changed using SP2-923 (default: 30 seconds)
3) T (30) means that toner is supplied intermittently in a 1/3 duty cycle (1 s on, 2 s off) for 30 seconds

2.6.7 TONER SUPPLY IN ABNORMAL SENSOR CONDITIONS

ID sensor

Readings are abnormal if any of the following conditions occur:

- Vsg ≤ 2.5V
- Vsg < 3.5V when maximum power (254) is applied
- Vsp ≥ 2.5V
- (Vsg – Vsp) < 1.0V
- ID sensor power required to make the standard output reaches the maximum value (254)

The above ID sensor values can be checked using SP2-221.

When this is detected, the machine changes the value of Vref to 2.5V then does the toner density control process (in a similar way to sensor control mode 2).

No SC code is generated if the ID sensor is defective.

TD Sensor

The TD sensor is checked every copy. If the readings from TD sensor become abnormal, the machine changes the toner density control mode to fixed supply mode 2, and the toner supply amount per page is always 200 ms, regardless of the value of SP2-925. Then at the end of a job (if the optional fax unit is installed), or 100 copies after the TD sensor error was detected (if no fax unit is installed), an SC code is generated (SC390) and the machine must be repaired. The 100-copy threshold can be adjusted with SP 2-992.

2.6.8 TONER NEAR END/END DETECTION AND RECOVERY

The toner near end and end conditions are detected using the Vt and Vref values, in a similar way to toner density control.

This is done in all toner supply modes except for fixed mode 2, when toner end is not detected.

Toner Near End Detection

If Vt is at level 6 (see the table on the previous page) five times consecutively, the machine enters the toner near end condition and the toner end indicator starts blinking. Then the machine supplies toner for a certain time, which depends on the setting of SP 2-923 (see the previous page).

Toner Near End Recovery

If the machine detects “Vt < (Vref or Vts) + 4S/5” twice consecutively when in one of the following situations, the machine leaves the toner near end condition.

- While in the toner recovery cycle (supplying toner on and off for 30 s – see the previous page) after the machine has detected a toner near end condition.
- During copying in the toner near end condition.
- If the front cover is opened and closed for more than 10 seconds while a toner near end condition exists.

Toner End Detection

There are two situations for entering the toner end condition.

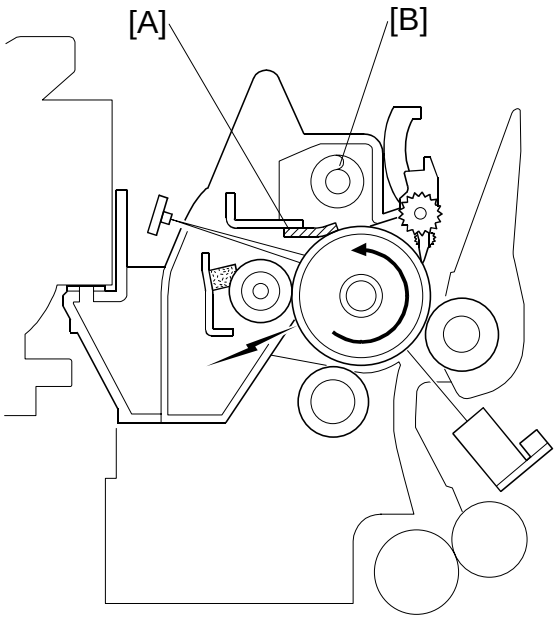
- When Vt is level 7 three times consecutively, the machine enters the toner end condition.
- When “Vt+S > Vt > (Vref or Vts) + 4S/5” is detected in the toner near end condition, then 50 copies can be made after this condition (the number of copies between this condition and toner end can be changed using SP2-213).

Toner End Recovery

If the front cover is opened and closed for 10 seconds while a toner end condition exists and the toner bottle is replaced, the machine attempts to recover using the same procedure as for toner near end/end detection.

2.7 DRUM CLEANING AND TONER RECYCLING

2.7.1 DRUM CLEANING



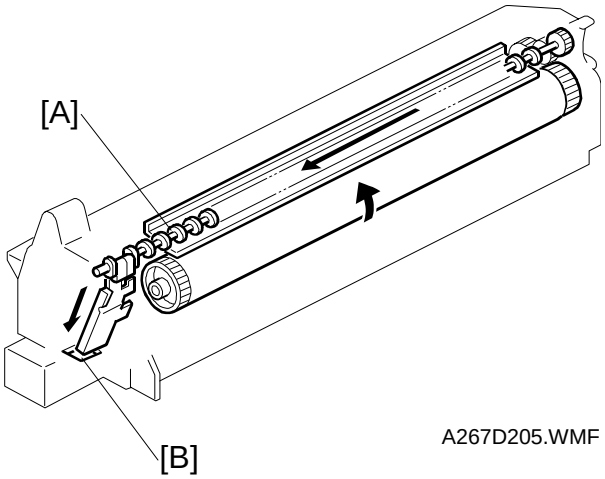
A267D201.WMF

The cleaning blade [A] removes any toner remaining on the drum after the image is transferred to the paper. This model uses a counter blade system.

The cleaning blade scrapes off toner remaining on the drum. When toner builds up in the cleaning unit, toner at the top of the pile is removed by the toner collection coil [B].

To remove the toner and other particles that are accumulated at the edge of the cleaning blade, the drum turns in reverse for about 5 mm at the end of every copy job.

2.7.2 TONER RECYCLING



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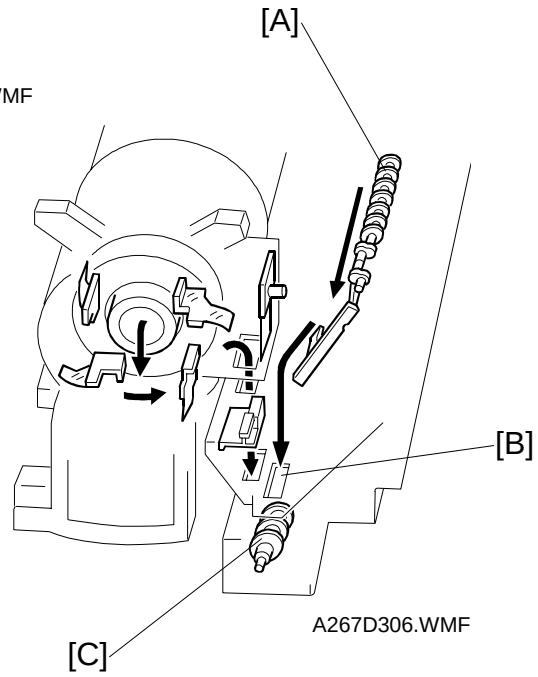
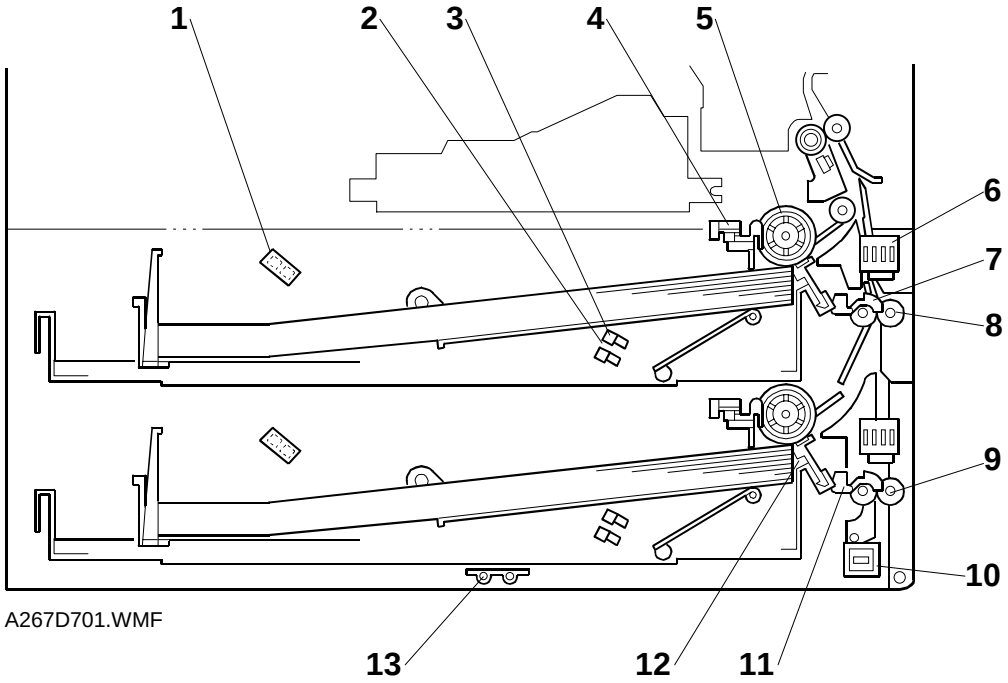


A267D306.WMF

Toner picked up by the toner collection coil [A], is transported to the opening [B] in the side of the PCU. Then, this toner falls into the development unit with new toner coming from the toner bottle and it is all mixed together by mixing auger 1 [C] and used again.

2.8 PAPER FEED

2.8.1 OVERVIEW



A267D701.WMF

There are two paper trays, each of which can hold 500 sheets.

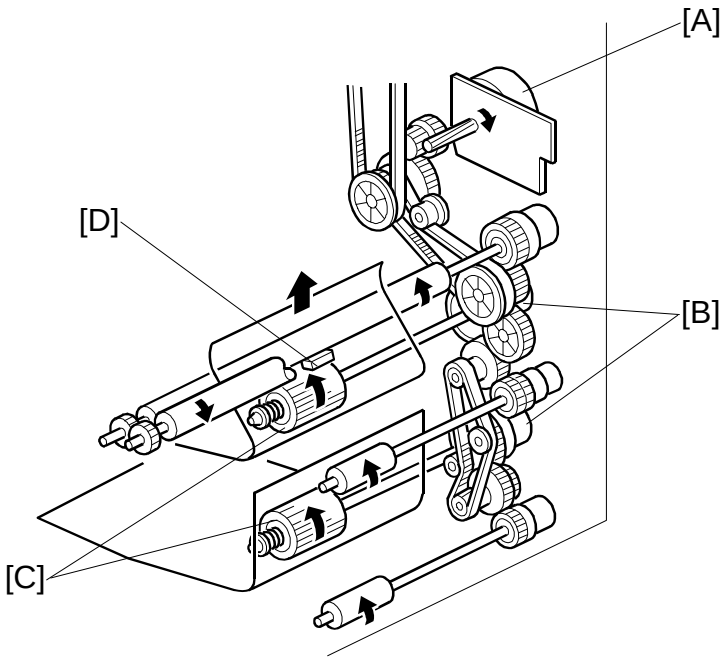
The paper tray feed stations use a friction pad system.

The two relay sensors are used for paper jam detection.

The components of the paper feed station are as follows.

1. Paper Lift Sensor
2. Paper Height –1 Sensor
3. Paper Height –2 Sensor
4. Paper End Sensor
5. Paper Feed Roller
6. Paper Size Sensor
7. Upper Relay Sensor
8. Upper Relay Roller
9. Lower Relay Roller
10. Special Paper Sensor
11. Lower Relay Sensor
12. Friction Pad
13. Tray Heater (Option)

2.8.2 PAPER FEED DRIVE MECHANISM

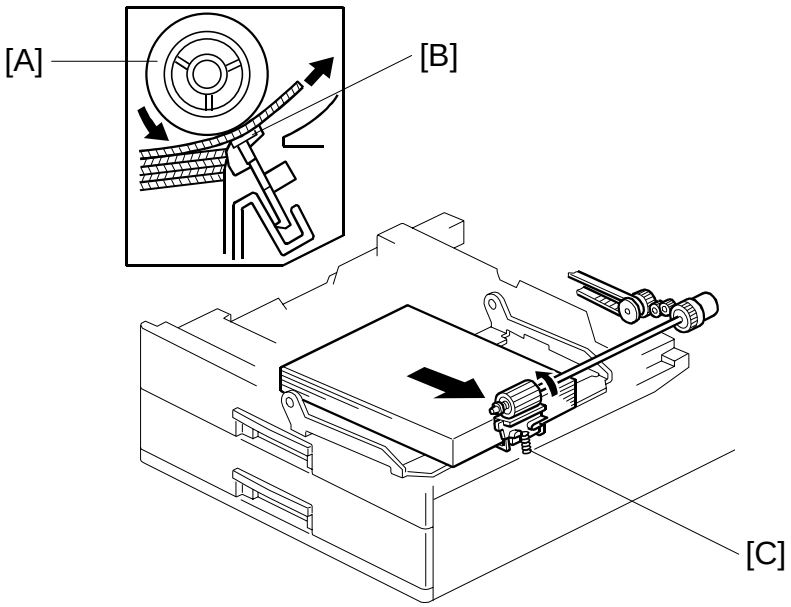


A267D702.WMF

The main motor [A] drives the pick-up and feed mechanism of both the first and second paper trays. The paper feed clutches [B] transfer drive from this motor to the paper feed rollers [C].

When the paper feed clutch turns on, the feed rollers start to feed the paper. The paper feed clutch stays on until shortly after the registration sensor [D] has been activated.

2.8.3 PAPER FEED AND SEPARATION MECHANISM

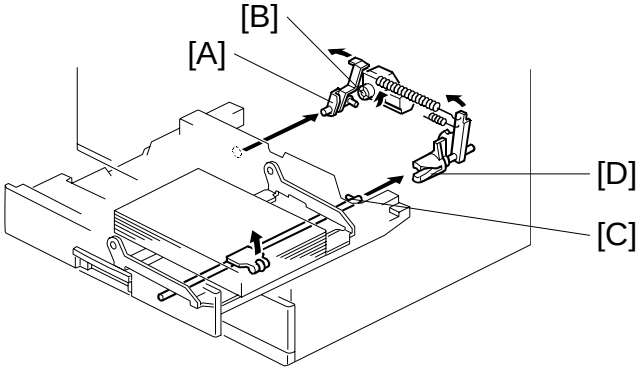


A860D104.WMF

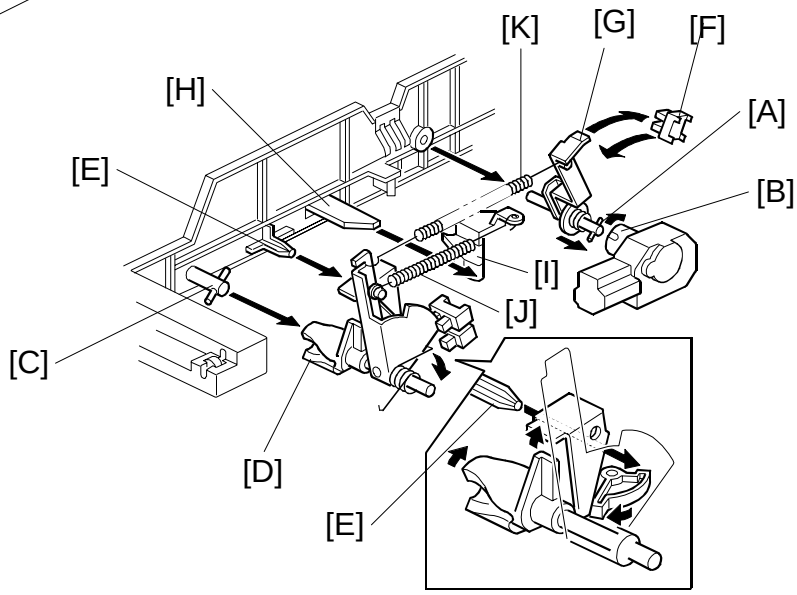
The paper feed roller [A] drives the top sheet of paper from the paper tray to the copier. The friction pad [B] allows only one sheet to feed at a time. The friction pad applies pressure to the feed roller with a spring [C].

The friction pad pressure cannot be adjusted.

2.8.4 PAPER LIFT MECHANISM



A265D521.WMF



A265D522.WMF

The paper size switch detects when the tray is pushed in.

When the paper tray is pushed into the machine, the pin [A] for the lift motor pressure shaft engages the lift motor coupling [B] and the pin [C] for the bottom plate lift shaft in the tray engages the bottom plate pressure lever coupling [D]. The pin [E] on the rear of the tray pushes the lock lever so that the lift motor can lift the bottom plate pressure lever.

The lift motor turns on, and turns clockwise as shown in the diagram. The main pressure spring [K] pulls the bottom plate pressure lever, and this lifts the tray bottom plate.

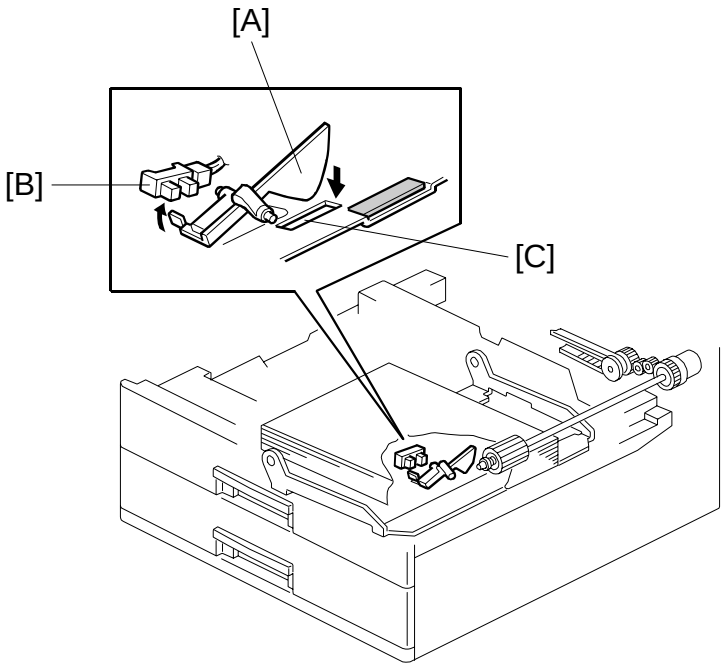
When the top of the stack touches the feed roller, the motor cannot pull up the plate any more, so it pulls the actuator [G] into the lift sensor [F]. Then the lift motor stops. The pressure of the feed roller on the paper is now too high, so the lift motor reverses a certain time (200 ms or 600 ms), depending on the paper size, to reduce this pressure. For smaller paper, it reverses the larger amount (600 ms) to reduce the pressure more.

NOTE: The relationship between the bottom plate pressure adjustment, paper size thresholds, and the related SP modes is explained in “Bottom Plate Pressure Adjustment for Paper Size”.

For A4-width paper or wider, a projection [H] on the side fence engages the secondary pressure spring [J] through a lever [I]. Then, the secondary pressure spring [J] applies paper feed pressure in addition to the main pressure spring [K], to ensure that extra pressure is applied to wider paper.

When the paper tray is pulled out, the pins [A, C] disengage from the couplings [B, D], and the bottom plate drops. To make it easier to push the tray in, the lift motor rotates backwards 1.7 seconds to return the bottom plate pressure lever coupling [D] to the original position. The amount of reverse can be adjusted with SP 1-912.

2.8.5 PAPER END DETECTION



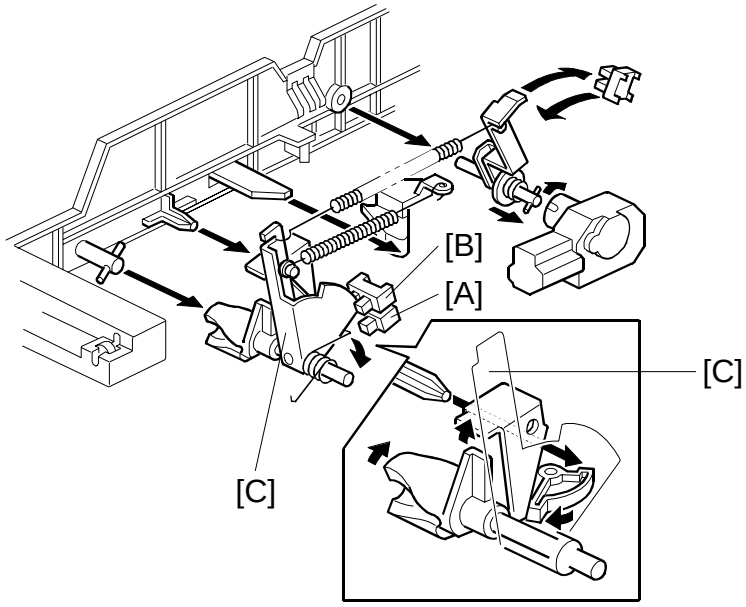
A265D520.WMF

If there is some paper in the paper tray, the paper stack raises the paper end feeler [A] and the paper end sensor [B] is deactivated.

When the paper tray runs out of paper, the paper end feeler drops into the cutout [C] in the tray bottom plate and the paper end sensor is activated.

When the paper tray is drawn out with no paper in the tray, the shape of the paper end feeler causes it to lift up.

2.8.6 PAPER HEIGHT DETECTION



A265D522.WMF

The amount of paper in the tray is detected by the combination of on/off signals from two paper height sensors [A] and [B]. However, these outputs are only used when the optional printer controller is installed.

When the amount of paper decreases, the bottom plate pressure lever [C] moves the actuator up.

The following combination of sensor signals is sent to the copier.

Amount of Paper	Paper Height Sensor 1	Paper Height Sensor 2
Near End	OFF	ON
30%	ON	ON
70%	ON	OFF
100%	OFF	OFF

When the tray contains paper of a small width, the paper feed pressure may become too low when the thickness of the remaining stack of paper has decreased. The lift motor rotates forward 400 ms after the sensor detects a certain amount of paper remaining in the tray to increase paper feed pressure, simulating the pressure generated by a full tray.

NOTE: The relationship between the bottom plate re-adjustment timing, paper size threshold, and the related SP modes is explained in “Bottom Plate Pressure Adjustment for Paper Size”.

2.8.7 FEED PRESSURE ADJUSTMENT FOR PAPER SIZE

Overview

For the friction pad system, the pressure from the top of the stack against the feed rolleris very important for paper feed quality from the paper tray. If the pressure is high, double feed may occur. On the other hand, if the pressure is low, non-feed may occur. Because of this, the pressure must be varied depending on the paper size, paper weight, and amount of paper remaining in the tray. To achieve this, the pressure for each paper tray can be adjusted using SP mode.

Paper Size Thresholds

The upward pressure from the bottom plate spring is always the same. However, downward pressure from the stack on the bottom plate depends on the paper size. Because of this, for a smaller paper size, the pressure of the top of the stack against the feed roller is more than normal (because of the smaller downward pressure from the stack), so adjustment may be necessary.

Using the following SP modes, either two or three paper size ranges can be specified. Using other SP modes (explained later), the pressure can be adjusted separately for each of these ranges to deal with any feed problems that have been occurring.

Paper Size	Normal	Small Size	Middle Size
	Greater than HLT/A5 (default setting)	HLT/A5 or smaller (default setting)	None (default setting)
1st paper tray	---	SP1-908-8	SP1-908-9
2nd paper tray	---	SP1-909-8	SP1-909-9
3rd paper tray	---	SP1-910-8	SP1-910-9
4th paper tray	---	SP1-911-8	SP1-911-9

Paper Size Ranges

For Three Size Ranges

Small paper size range: Paper sizes equal to the ‘Small’ SP mode value, or smaller.

Middle paper size range: Paper sizes greater than the small paper size, up to and including the middle paper size specified by the ‘Middle’ SP mode.

Normal paper size range: Paper sizes greater than the ‘Middle’ SP mode.

For Two Size Ranges

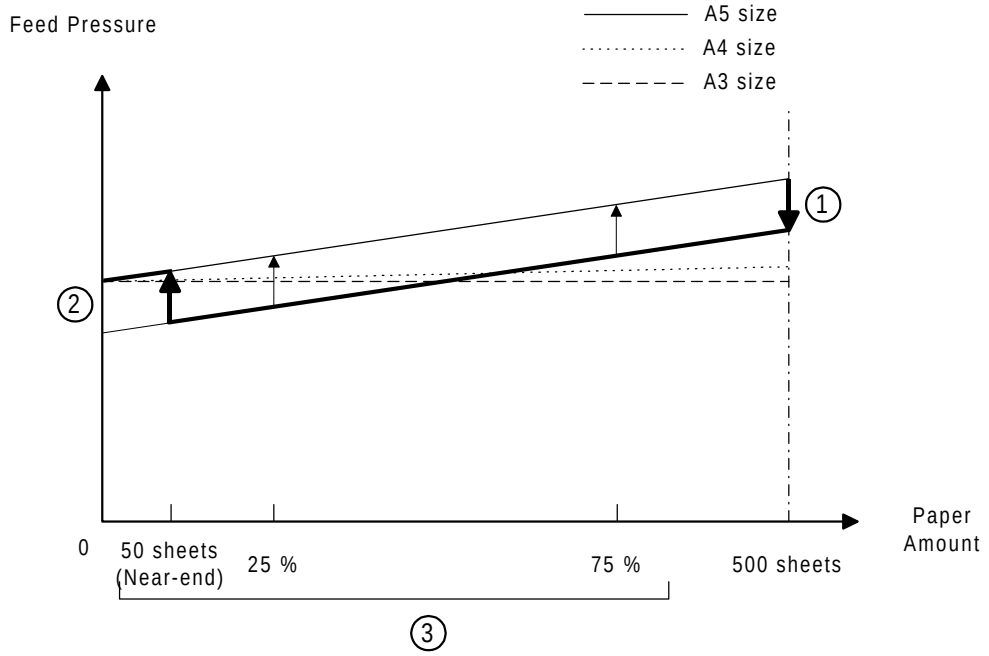
Small paper size range: Paper sizes equal to the ‘Small’ SP mode value, or smaller.

Normal paper size range: Paper sizes greater than the ‘Small’ SP mode.

Feed Pressure Adjustment

The pressure can be adjusted to solve a paper feed problem. This adjusts the amount of lift motor reverse just after the lift sensor is activated when lifting the stack to the paper feed position. To apply less pressure to the top of the stack, the amount of reverse should be increased.

Effect of the Amount of Remaining Paper



A265D518.WMF

From tray full to paper near-end

The pressure between the top of the stack and the fed roller also depends on the amount of remaining paper, especially for small paper sizes, as shown in the above graph. The pressure for A5 changes significantly between stack heights of 500 sheets and 50 sheets, but not much for A4 or A3 paper.

For 500 sheets of A5, the pressure is too high. To counter this, the lift motor reverses 600 ms (① in the graph), as explained in the previous section. The SP modes in the following table are for solving feed problems that occur when the tray is between full and near-end.

Paper Size	Normal	Small Size	Middle Size
	Greater than HLT/A5 (default setting)	HLT/A5 or smaller (default setting)	None (default setting)
1st paper tray	SP1-908-1	SP1-908-2	SP1-908-3
2nd paper tray	SP1-909-1	SP1-909-2	SP1-909-3
3rd paper tray	SP1-910-1	SP1-910-2	SP1-910-3
4th paper tray	SP1-911-1	SP1-911-2	SP1-911-3
Default (all trays)	200 ms	600 ms	200 ms (default: not used)

From paper near end to paper end

When paper is used up, the pressure on the bottom plate reduces, so the upward pressure increases, causing the pressure of the feed roller against the top of the stack to increase.

However, for small paper sizes, because of the previous correction (600 ms reverse rotation of the lift motor), the pressure between the feed roller and the top of the stack becomes too small at some point as paper is used up, and this could cause paper feed problems. This condition is more significant for smaller paper sizes, such as A5, as shown in the diagram.

If a paper feed problem occurs when the stack is partly used up, the pressure can be re-adjusted (② in the graph) using the following SP modes. The default is set for 50 sheets (at the near-end point)

The lift motor rotates forward for the time specified by the SP mode to increase the pressure.

Paper Size	Small Size	Middle Size
	HLT/A5 or smaller (default setting)	None (default setting)
1st paper tray	SP1-908-4	SP1-908-5
2nd paper tray	SP1-909-4	SP1-909-5
3rd paper tray	SP1-910-4	SP1-910-5
4th paper tray	SP1-911-4	SP1-911-5
Default (all trays)	400 ms	300 ms (default: not used)

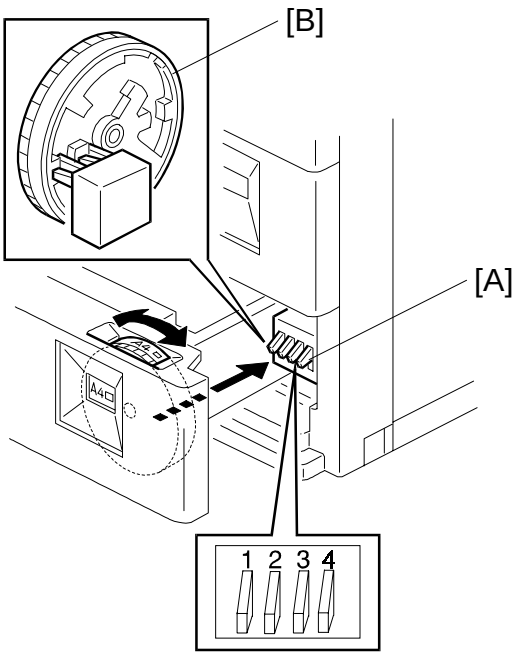
Also, the point at which this adjustment is applied (near-end [50 sheets], 25% full, 75% full) can be selected (③ in the graph) using the following SP modes.

Paper Size	Small Size	Middle Size
	HLT/A5 or smaller (default setting)	None (default setting)
1st paper tray	SP1-908-6	SP1-908-7
2nd paper tray	SP1-909-6	SP1-909-7
3rd paper tray	SP1-910-6	SP1-910-7
4th paper tray	SP1-911-6	SP1-911-7
Default (all trays)	Near-end	Near-end (default: not used)

2.8.8 PAPER SIZE DETECTION

SW / Size	1	2	3	4
A3	❍	❍	❍	❍
A4 Sideways	●	●	❍	●
A4 Lengthwise	●	●	❍	❍
A5 Lengthwise, 8 1/2" x 14"	❍	❍	●	●
B4, 11" x 17"	●	❍	●	❍
B5 Sideways, 11" x 8 1/2"	●	❍	❍	❍
B5 Lengthwise, 8 1/2" x 11"	❍	●	●	●
* (Asterisk)	❍	●	❍	●

●: ON (Not pushed)
❍: OFF (Pushed)



A265D523.WMF

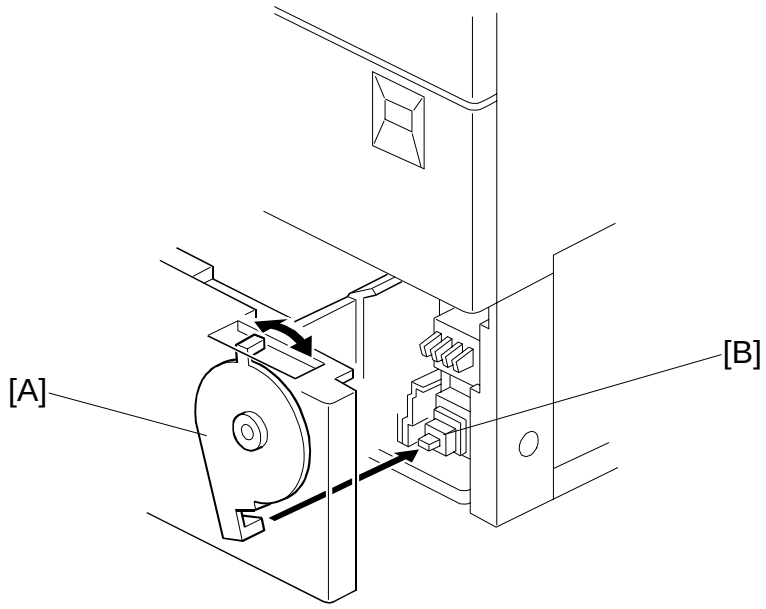
There are four paper size microswitches [A] on the front right plate of the paper tray unit. The switches are actuated by a paper size actuator [B] behind the paper size indicator plate, which is on the front right of the tray.

Each paper size has its own actuator, with a unique combination of notches. To determine which size has been installed, the CPU reads which microswitches the actuator has switched off.

The CPU disables paper feed from a tray if the paper size cannot be detected. If the paper size actuator is broken, or if there is no tray installed, the Add Paper indicator will light.

When the paper size actuator is at the "*" mark, the paper tray can be set up to accommodate one of a wider range of paper sizes by using user tools. If the paper size for this position is changed without changing the user tool setting, a paper jam will result.

2.8.9 SPECIAL PAPER SETTING



A267D703.WMF

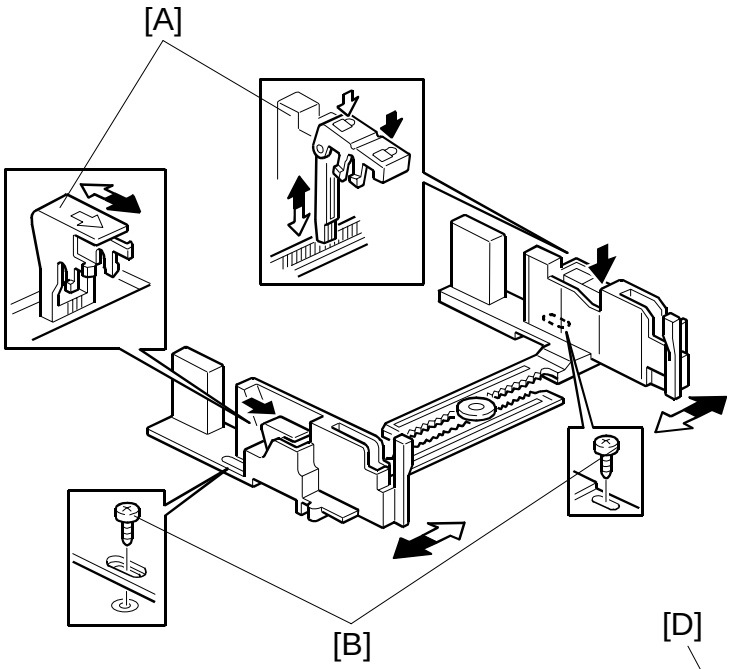
When feeding thick paper and envelopes, the user must use the 2nd paper tray (if the optional by-pass table is not installed), and turn lever [A] to the right. Then, when sliding the tray into the machine, the lever does not push the special paper switch [B] (it stays off), and the machine detects that there is special paper in the 2nd paper tray.

When the machine detects the special paper signal, the fusing temperature and the transfer roller current will be changed as follows.

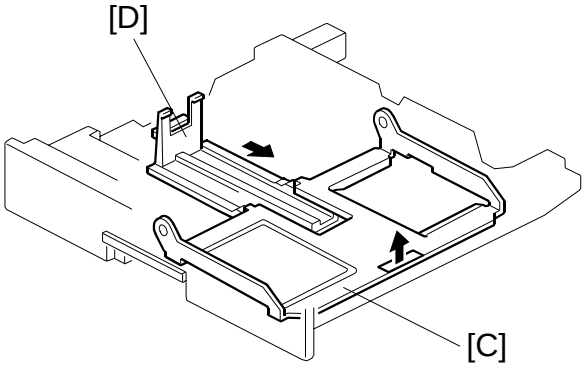
1. Fusing temperature: Current operation temperature + 10 °C
2. Transfer roller current:
   A3 width (11”): 14 µA
   B4 width (10”): 15 µA
   A4 width (8.5”): 17 µA
   A5 width (5.5”): 20 µA

Note that for the by-pass tray, the fusing and transfer conditions for special paper are also applied if the user uses thick (non-standard) mode.

2.8.10 SIDE AND END FENCES



A860D110.WMF



A860D109.WMF

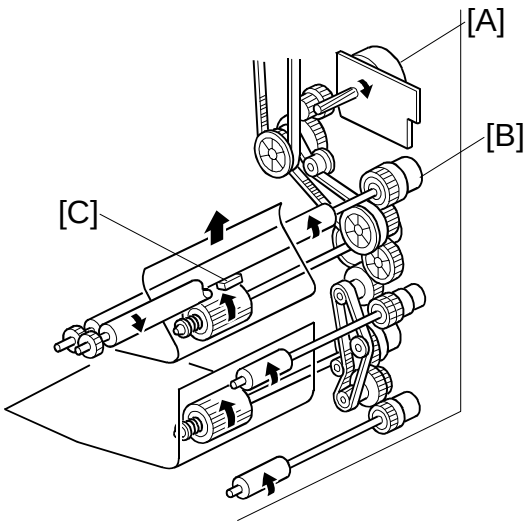
Side Fences

If the tray is full of paper and it is pushed in strongly, the fences may deform or bend. This may cause the paper to skew or the side-to-side registration to be incorrect. To correct this, each side fence has a stopper [A] attached to it. Each side fence can be secured with a screw [B], for customers who do not want to change the paper size.

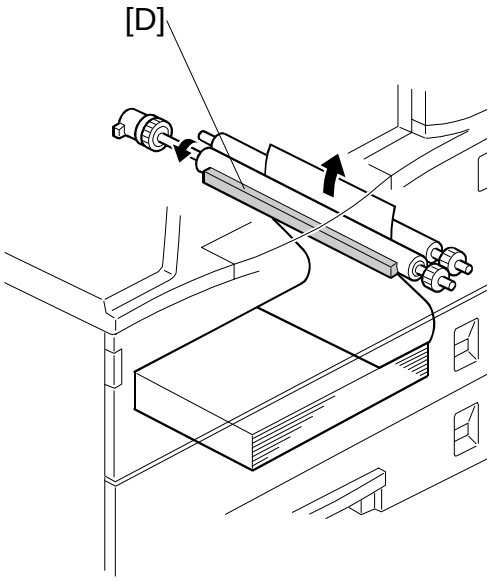
End Fence

As the amount of paper in the tray decreases, the bottom plate [C] lifts up gradually. The end fence [D] is connected to the bottom plate. When the tray bottom plate rises, the end fence moves forward and pushes the back of the paper stack to keep it squared up.

2.8.11 PAPER REGISTRATION



A267D702.WMF



A267D704.WMF

The drive from the main motor [A] is transmitted to the registration roller through the registration clutch gear [B].

The registration sensor [C] is used for correcting paper skew and for detecting paper misfeeds.

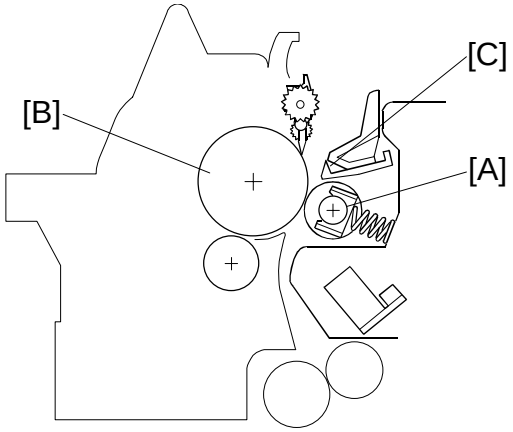
The cleaning pad [D] contacts the registration roller. It removes paper dust from the registration roller so that this dust will not transfer into the development unit through the drum cleaning unit.

The amount of paper buckle at the registration roller to correct skew can be adjusted with SP 1-003.

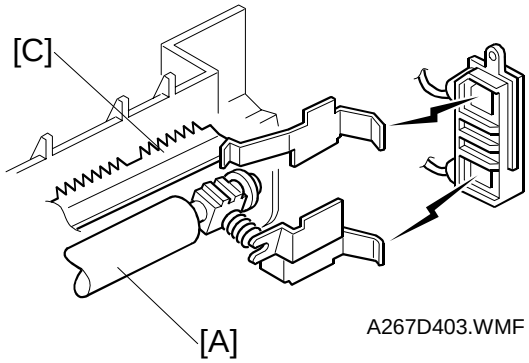
If jams frequently occur after registration, the paper feed clutch can be re-energized so that the feed roller can assist the registration roller to re-start paper feed. This may be needed when feeding thicker paper. This adjustment is made with SP 1-903; it can be adjusted separately for tray 1 and the by-pass feeder, so place the problem paper type in one of these and adjust SP 1-903 for that tray only.

2.9 IMAGE TRANSFER AND PAPER SEPARATION

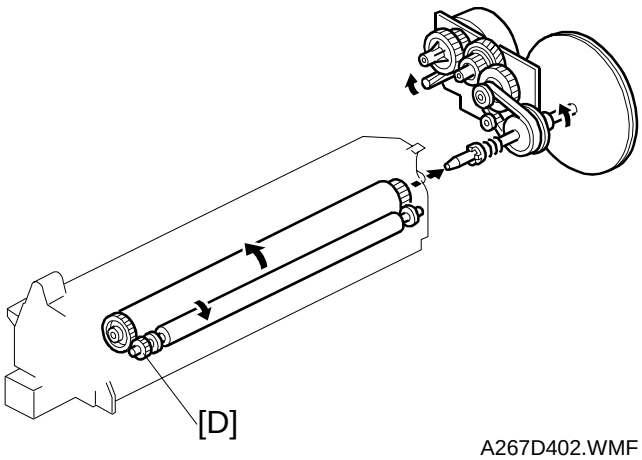
2.9.1 OVERVIEW



A267D401.WMF



A267D403.WMF



A267D402.WMF

The machine uses a transfer roller [A], which touches the surface of the drum [B]. The high voltage supply board supplies a positive current to the transfer roller, which attracts the toner from the drum onto the paper. The current depends on the paper width, paper type, and paper feed tray.

The curvature of the drum and the discharge plate [C] help the paper to separate from the drum. The high voltage supply board also supplies a negative dc voltage to the discharge plate.

Drive from the drum through a gear [D] turns the transfer roller

2.9.2 IMAGE TRANSFER CURRENT TIMING

There are two transfer current levels: low transfer current level and high transfer current level. The image transfer procedure is as follows:

1. When the CPU receives the image writing start signal, the CPU instructs the high voltage supply board to supply +10μA (low transfer current level) to the roller. This prevents any positively charged toner on the drum surface from transferring to the transfer roller.
2. At a certain time after the low transfer current has been supplied to the roller, +13μA (paper fed from the paper tray) is applied to the roller to transfer the toner to the paper.
3. After the trailing edge of the paper has passed through the roller, transfer current turns off. In multiple copy mode, the transfer current shifts again to the low transfer current.

The default transfer roller current (high transfer current level) is as shown in the following table. The transfer current can be adjusted using SP2-301, except for the low transfer current.

Paper Size	Paper Tray / By-pass Tray (Normal)	Duplex (2nd Side)	By-pass Tray (Thick) / 2nd Paper Tray (Special Paper)
A3/11" x 17", A4/8 1/2 x 11"sideways	13 μA	10 μA	14 μA
B4	13 μA	12 μA	15 μA
A4/11" x 8 1/2 lengthwise, A5/5 1/2 x 8 1/2 sidewise	13 μA	16 μA	17 μA
A5/8 1/2 x 5 1/2 lengthwise	15 μA	16 μA	20 μA

Be careful when increasing the transfer current. This might cause a ghosting effect, in which part of the image at the top of the page is repeated lower down the page at a lower density. It may also damage the OPC drum in the worst case.

2.9.3 TRANSFER ROLLER CLEANING

If the paper size is smaller than the image, or if a paper jam occurs during printing, toner may be transferred to the roller surface. To prevent the toner from transferring to the back side of the printouts, the transfer roller requires cleaning before the next printing run.

During transfer roller cleaning, the high voltage supply unit supplies a negative cleaning current (-4 μA) to the transfer roller. Any negatively charged toner on the transfer roller is then transferred back to the drum. Then a positive cleaning current (+10 μA) is applied to the transfer roller to push back to the drum any positively charged toner on the transfer roller.

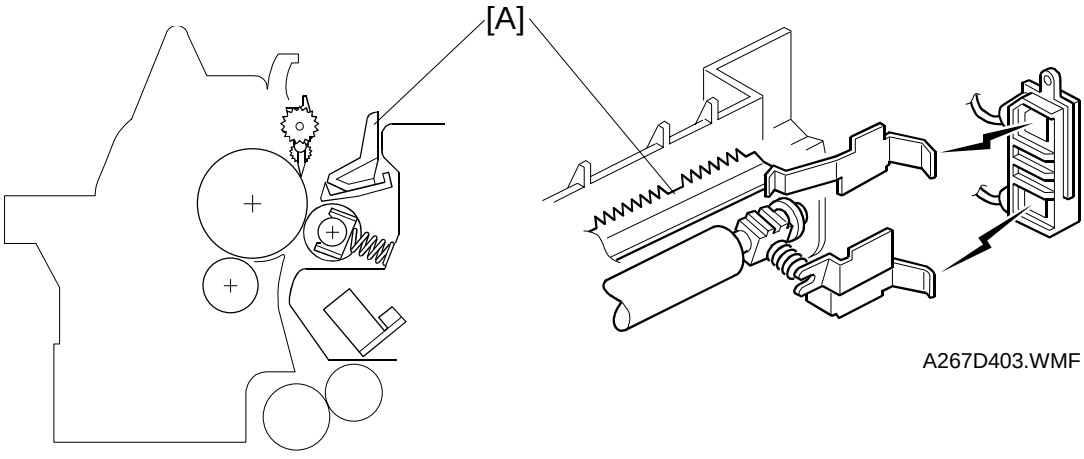
The machine goes through the cleaning mode in the following conditions:

- Before starting the printing job (only if enabled with SP2-996; note that the default setting is off)
- Just after the power is switched on.
- After a copy jam has been cleared

The transfer roller cleaning function is done.

Also, the transfer roller cleaning current can be adjusted using SP2-301-4.

2.9.4 PAPER SEPARATION MECHANISM



A267D403.WMF

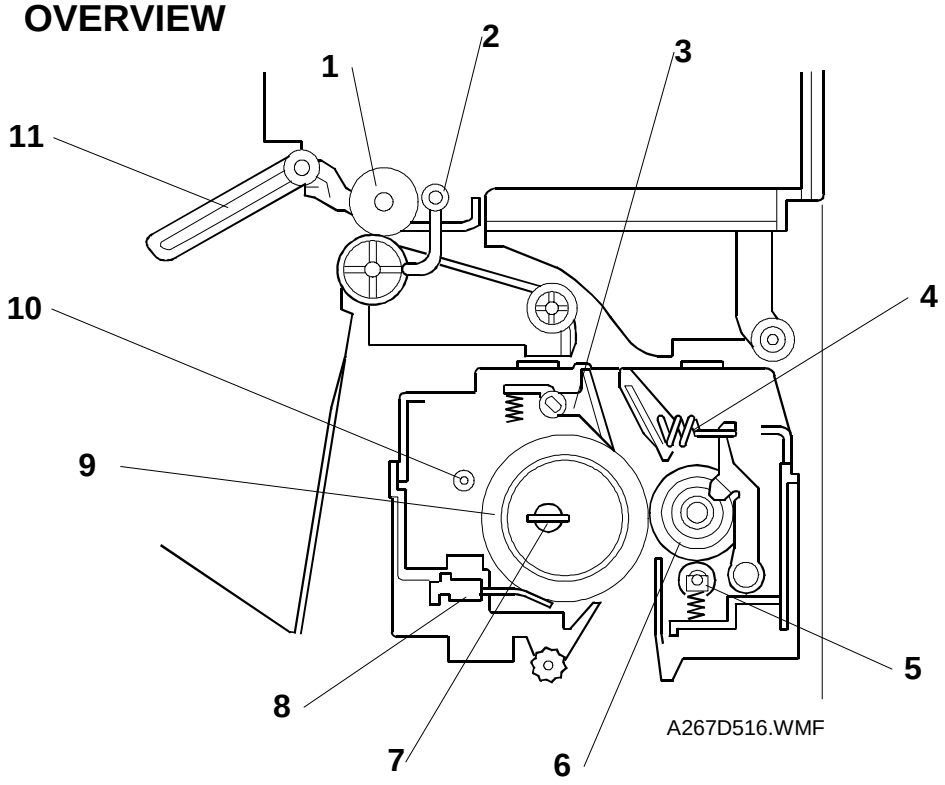
A267D401.WMF

The discharge plate [A] and the drum curvature of the drum help the paper to separate away from the drum. The high voltage supply board applies a constant dc voltage, -1.8 kV (when feeding from a paper tray) or –2.1 kV (from the duplex unit) to the discharge plate.

The discharge plate voltage can be adjusted using SP2-901.

2.10 IMAGE FUSING AND PAPER EXIT

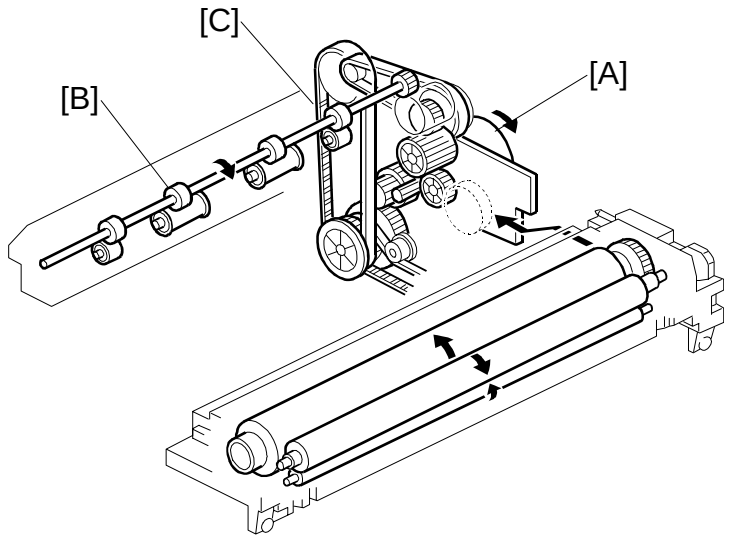
2.10.1 OVERVIEW



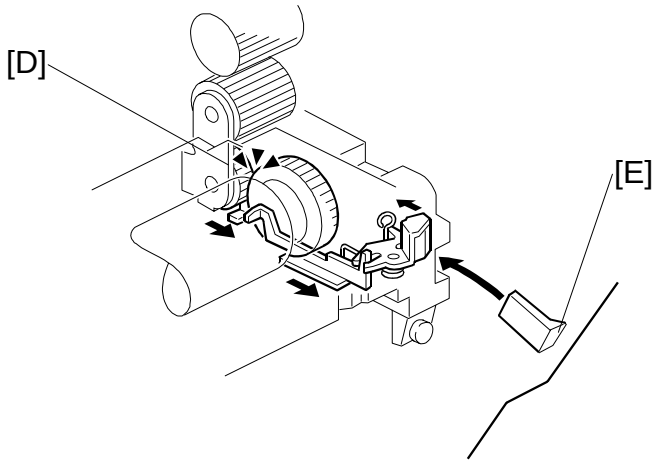
The fusing unit and paper exit area consist of the following parts.

1. Paper exit roller
2. Fusing exit sensor
3. Hot roller strippers
4. Pressure spring
5. Cleaning roller
6. Pressure roller
7. Fusing lamps
8. Thermistor
9. Hot roller
10. Thermofuse
11. Paper overflow sensor

2.10.2 FUSING DRIVE AND RELEASE MECHANISM



A267D504.WMF

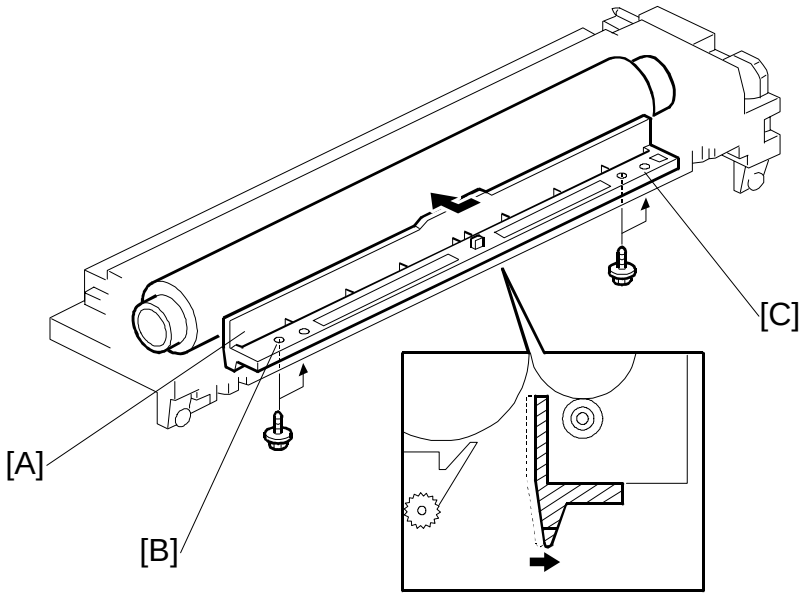


A267D505.WMF

The main motor [A] drives the fusing unit through a gear train and drives the paper exit rollers [B] through a timing belt [C].

The fusing unit release mechanism automatically disengages the fusing unit drive gear [D] when the right cover [E] is opened. This allows the fusing unit drive gear to rotate freely so that misfed paper can easily be removed.

2.10.3 FUSING ENTRANCE GUIDE SHIFT MECHANISM

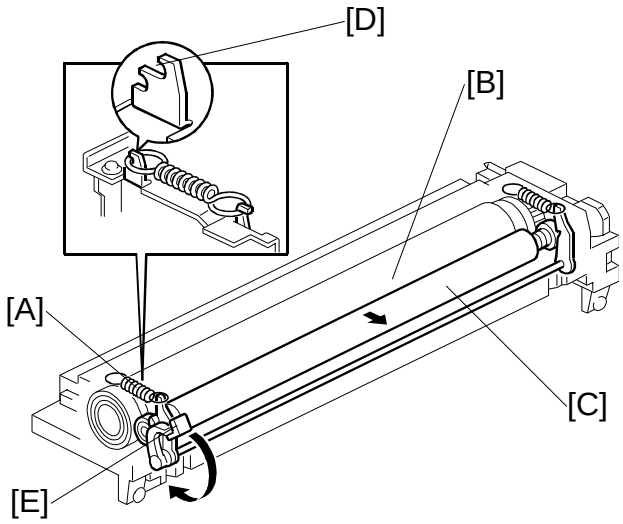


A267D506.WMF

The entrance guide [A] is adjustable for paper thickness to prevent creasing. The left screw holes [B] on each side are used as the default setting.

If creasing occurs frequently in the fusing unit, adjust the entrance guide to the right, by securing it with the other holes [C]. This allows more direct access to the gap between the hot roller and the pressure roller.

2.10.4 PRESSURE ROLLER



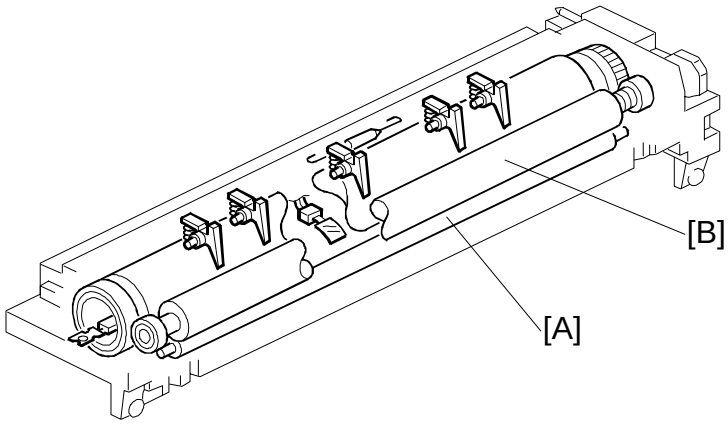
A267D502.WMF

The pressure springs [A] constantly apply pressure between the hot roller [B] and the pressure roller [C].

Applied pressure can be changed by adjusting the position of the pressure springs. The spring is positioned at the top [D] as the default setting.

The user moves lever [E] when using thicker copy paper or envelopes, to reduce the pressure between the hot and pressure rollers.

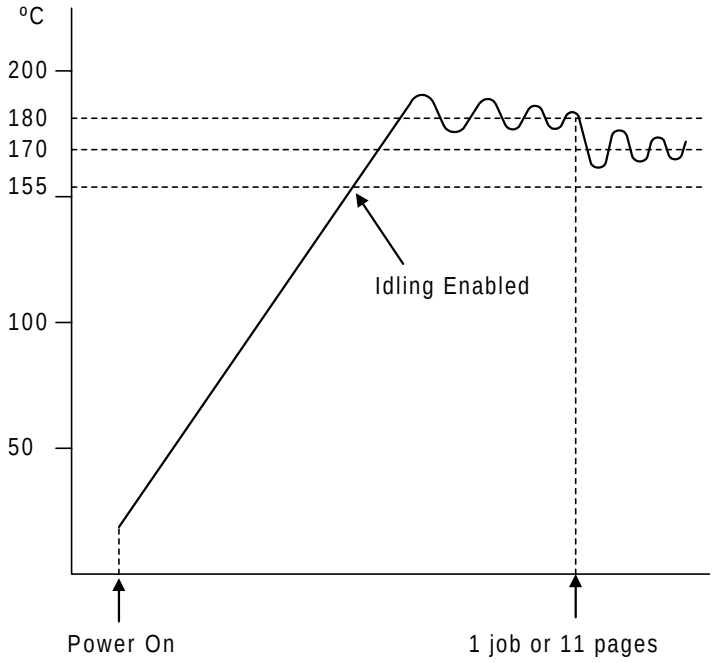
2.10.5 CLEANING MECHANISM



A267D503.WMF

The cleaning roller [A] is always in contact with the pressure roller [B]. It collects toner and paper dust adhered to the surface of the pressure roller.

2.10.6 FUSING TEMPERATURE CONTROL



A267D511.WMF

Temperature Control

When the main power switch is turned on, the CPU turns on the fusing lamp to maintain the fusing temperature of 180°C for the first job, or for the first 11 consecutive pages of printing. After that, the machine maintains the fusing temperature at 170°C.

Note that the fusing temperature is higher if the user uses special paper in the 2nd tray or thick paper mode from the bypass tray (see Paper Feed – Special Paper).

To prevent each end of the hot roller temperature from becoming too high, the machine lowers the fusing temperature to 155°C when it detects that paper which is less than 216 mm width is consecutively fed.

Fusing Lamp Control

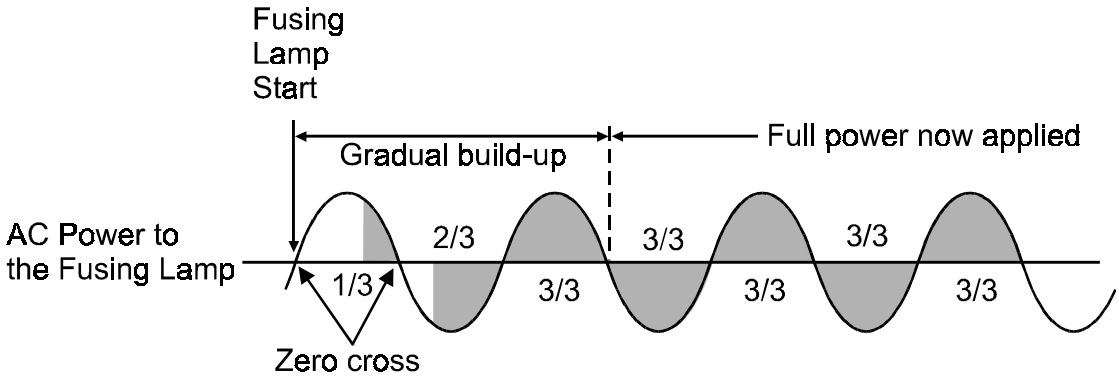
Turning on and off the fusing lamp power causes fluorescent light in the room to flicker. To reduce the flickering, use the following SP modes.

Fusing temperature detection cycle (SP mode 1-108)
The CPU checks the output from the fusing thermistor once a second (default setting). The CPU compares the current and previous temperatures. Based on the result, it then decides how long the fusing lamp power should be on during the next one-second interval (also, if the current temperature is too high, the power will not be needed).

Starting and stopping the fusing lamp power every second causes fluorescent lighting in the room to flicker. To reduce this flickering, use SP1-108 to change the cycle from 1 second to 3 seconds.

Fusing soft-start (SP mode 1-107)
In addition, whenever the fusing lamp power switches on, full power is applied to the fusing lamp gradually, not all at once. This prevents the power in the room from dropping suddenly. This feature is known as “Soft Start”. The machine does this by gradually allowing more power to the fusing lamp over a number of zero-cross cycles of the ac supply. The diagram below shows full power being applied gradually over the duration of 3 zero-cross cycles. With SP1-107, this number can be set to 3, 10, or 20 (USA version) or 5, 10, or 20 (Europe/Asia version). Soft start occurs every time the fusing lamp power switches on (i.e., at some time during every second), not just at the start of the print job.

NOTE: This SP mode is effective to counter flickering lights. However, generated noise increases if the setting is changed from the default. If a radio or a TV is close by the machine, the noise may have some effect on the image or sound.



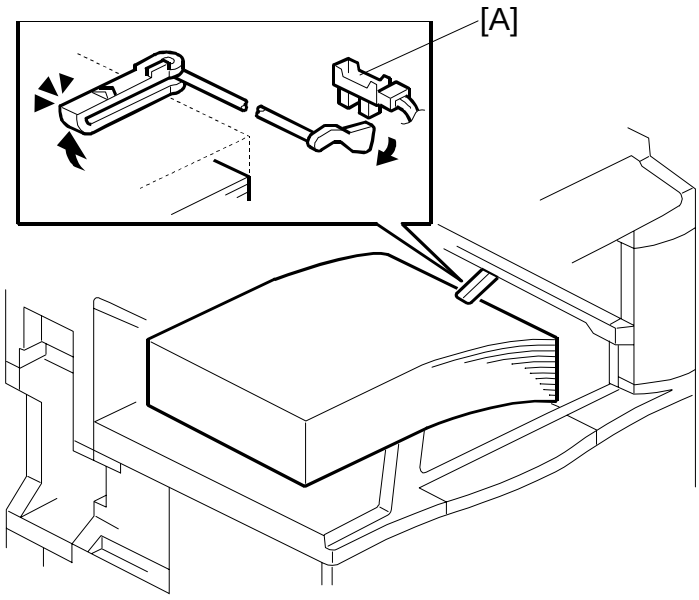
A267D512.WMF

2.10.7 OVERHEAT PROTECTION

If the hot roller temperature becomes higher than 231°C, the CPU cuts off the power to the fusing lamp. At the same time, SC543 is generated.

Even if the thermistor overheat protection fails, there is a thermofuse in series with the common ground line of the fusing lamp. If the temperature of the thremofuse reaches 169°C, the thermofuse opens, removing power from the fusing lamp. At the same time, SC 542 is generated and the machine stops operating.

2.10.8 PAPER EXIT

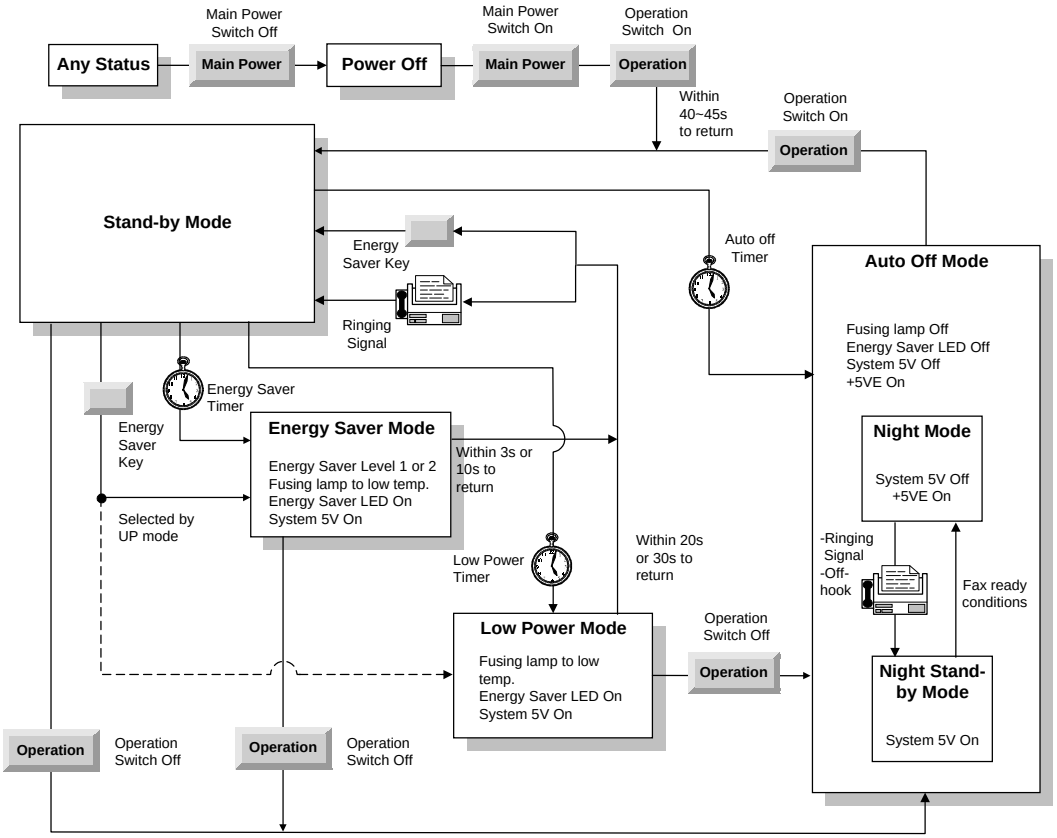


A267D601.WMF

The paper overflow detection sensor [A] is located at the paper exit section of the fusing unit. When this sensor is activated, the machine detects that the paper stack height exceeded a certain limit and stops printing.

2.11 ENERGY SAVER MODES

2.11.1 OVERVIEW



A267D530.WMF

When the machine is not used, the energy saver function reduces power consumption by lowering the fusing temperature.

This machine has four types of energy saver mode as follows.

1) Energy saver mode (called 'panel off mode' in the operation manual)
2) Low power mode (called 'energy saver mode' in the operation manual)
3) Auto off mode (copier configuration only)
4) Night mode (copier/fax, copier/printer, copier/fax/printer configurations only)

These modes are controlled by the following UP and SP modes.

- Energy saver timer
- Low power timer
- Auto off timer
- Energy saver mode
- Auto off disabling (UP mode only)

The way that the machine operates depends on the combination of installed equipment (copier only, or whether a fax and/or printer is installed).

2.11.2 ENERGY SAVER MODE

Entering the energy saver mode

The machine enters energy saver mode when one of the following is done.

- The Energy Saver Key is held down for a second.
- The energy saver timer runs out after the last job (User Tools - System Settings - Panel Off Timer: default setting is 60 s).

What happens in energy saver mode

When the machine enters energy saver mode, the fusing lamp drops to a certain temperature and the operation panel indicators are turned off except for the Energy Saver LED and the Power LED.

If the CPU receives the image print out command from an application (e. g. to print incoming fax data or to print data from a PC), the fusing temperature rises to print the data. However, the operation indicators stay off.

Return to stand-by mode

If one of the following is done, the machine returns to stand-by mode:

- The Energy Saver Mode key is pressed
- An original is placed in the ADF
- The ADF is lifted
- A sheet of paper is placed in the by-pass feed table

The recovery time from energy saver mode is about **3 s**.

Mode	Operation Switch	Energy Saver LED	Fusing Temp.	System +5V
Energy Saver Mode	On	On	160 °C	On

2.11.3 LOW POWER MODE

Entering the low power mode

The machine enters low power mode when:

- The low power shift timer runs out after the last job.
  (User Tools - System Settings - Energy Saver Timer: default setting is 15 min)

What happens in low power mode

There are two low power modes; Low Power Mode Level 1 and Low Power Mode Level 2. This can be selected by UP mode (User Tools - System Settings - Energy Saver Level).

The fusing lamp drops to a certain temperature, as shown in the table below (the temperature drops more than that in energy saver mode). The other conditions are the same as for the energy saver mode.

The fusing temperature for the level 2 low power mode can be changed by SP 1-105 (the default setting is 80 °C).

Return to stand-by mode

The machine returns to standby mode in the same way as from the energy saver mode.

Mode	Operation Switch	Energy Saver LED	Fusing Temp.	Approx. Recovery Time	System +5V
Low Power Mode Level 1	On	On	120 °C	15 s	On
Low Power Mode Level 2	On	On	80 °C	30 s	On

2.11.4 AUTO OFF MODE

Auto off mode is used only if no optional fax or printer unit is installed.

Entering auto off mode

The machine enters auto off mode when one of the following is done.

- The auto off timer runs out after the last job (SP 5-904 or User Tools – System Settings – Auto Off Timer: default setting is 60 min)
- The operation switch is pressed to turn the power off

What happens in auto off mode

When the machine enters auto off mode, the operation switch (USA) or the main power switch (Europe/Asia) turns off automatically. The fusing lamp and all dc supplies except +5VE (+5V for energy saver mode) turn off. At this time, only the main power LED is lit.

Returning to stand-by mode

The machine returns to stand-by mode when the operation switch (USA) or the main power switch (Europe/Asia) is pressed.

Operation Switch	Energy Saver LED	Fusing Temp.	System +5V	Note
Off	Off	Room Temp. (Fusing lamp off)	Off	Only +5VE is supplied to the BICU.

Disabling auto off mode

If the user wishes to disable auto off mode, use the following user tool: User Tools – System Settings – AOF (change the setting to ‘OFF’).

2.11.5 NIGHT MODE

This is used instead of auto off mode when an optional fax and/or printer unit is installed.

There are two types of night mode: Night Stand-by Mode and Night Mode. The difference between night stand-by mode and night mode is the machine's condition when the machine enters auto off mode.

Entering night stand-by and night modes

The machine enters the night stand-by mode and night modes when one of the following is done.

- The operation switch is pressed to turn the power off
- The auto off timer runs out (the operation switch is then turned off)

If the machine is in one or more of the following conditions, the machine enters night stand-by mode. If not, the machine enters night mode.

- Error or SC condition
- An optional G4 unit is installed
- Image data is stored in the memory
- During memory Tx or polling Rx
- The handset is off hook
- An original is in the ADF
- The ADF is open
- Paper is left in the Duplex unit or staple tray

What happens in night stand-by and night modes

When the machine enters either of these modes, the fusing lamp and operation switch turn off, and only the main power LED is lit.

Night stand-by mode

The system +5V and +24 V are supplied to all components.

Note that SP5-909 allows +24V to be supplied during night mode. This allows the machine's condition to be displayed on the screen, so that any problems such as paper end can be discovered quickly, to allow normal reception and printing of fax messages.

Night mode

The system +5V supply is also turned off. However, +5VE (+5V for energy saver mode) is still activated. When the machine detects a ringing signal, or off-hook signal, the machine goes back to night stand-by mode and the system +5V and +24V supplies are activated. Then the machine receives the incoming message and prints it.

Returning to stand-by mode

The machine returns to stand-by mode when the operation switch is pressed.

The recovery time is about 45 s.

Mode	Operation Switch	Energy Saver LED	Fusing Temp.	System +5V	Note
Night stand-by mode	Off	Off	Room Temp. (Fusing lamp off)	On	
Night mode	Off	Off	Room Temp. (Fusing lamp off)	Off	Only +5VE is supplied to the fax controller.

3. INSTALLATION PROCEDURE

3.1 INSTALLATION REQUIREMENTS

3.1.1 ENVIRONMENT

1. Temperature Range: 10 °C to 32 °C (50 °F to 89.6 °F)
2. Humidity Range: 15 % to 80 % RH
3. Ambient Illumination: Less than 1,500 lux (do not expose to direct sunlight.)
4. Ventilation: Room air should turn over at least 30 m3/hr/person
5. Ambient Dust: Less than 0.10 mg/m^3 (2.7 x 10 -6 oz/yd^3)
6. Avoid an area which is exposed to sudden temperature changes. This includes:
   1) Areas directly exposed to cool air from an air conditioner.
   2) Areas directly exposed to heat from a heater.
7. Do not place the machine in an area where it will be exposed to corrosive gases.
8. Do not install the machine at any location over 2,000 m (6,500 ft.) above sea level.
9. Place the copier on a strong and level base. (Inclination on any side should be no more than 5 mm.)
10. Do not place the machine where it may be subjected to strong vibrations.

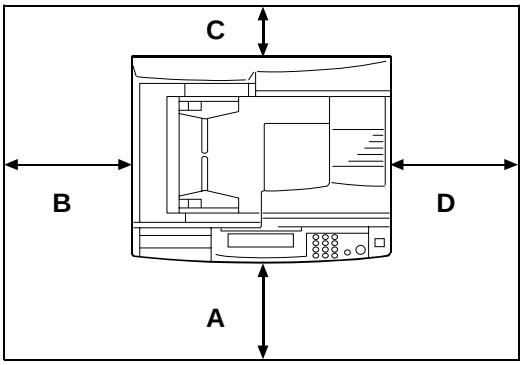
3.1.2 MACHINE LEVEL

Front to back: Within 5 mm (0.2”) of level

Right to left: With in 5 mm (0.2”) of level

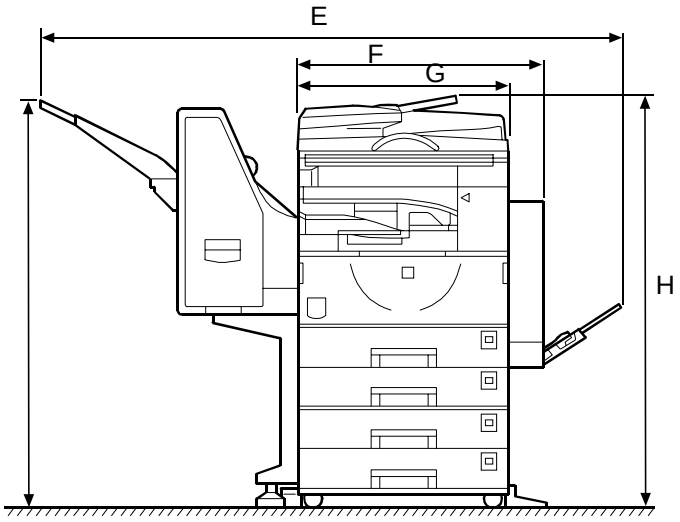
3.1.3 MINIMUM SPACE REQUIREMENTS

Place the copier near the power source, providing clearance as shown:



A267I201.WMF

A: In Front: Over 750 mm (29.6")
B: Left: Over 10 mm (4")
C: To Rear: Over 10 mm (4")
D: Right: Over 10 mm (4")



A267I202.WMF

E: 1406 mm (55.4")
F: 640 mm (25.2")
G: 550 mm (21.7")
H: 1137 mm (44.8")

NOTE: The 750 mm recommended for the space at the front is only for pulling out the paper tray. If an operator stands at the front of the copier, more space is required.

3.1.4 POWER REQUIREMENTS

⚠CAUTION

1. **Make sure that the wall outlet is near the copier and easily accessible. Make sure the plug is firmly inserted in the outlet.**
2. **Avoid multi-wiring.**
3. **Be sure to ground the machine.**

1. Input voltage level: 120 V, 60 Hz: More than 12 A
   220 V ~ 240 V, 50 Hz/60 Hz: More than 6 A
   110V, 50 Hz/60 Hz: More than 13 A
2. Permissible voltage fluctuation: ±10 %
3. Do not set anything on the power cord.

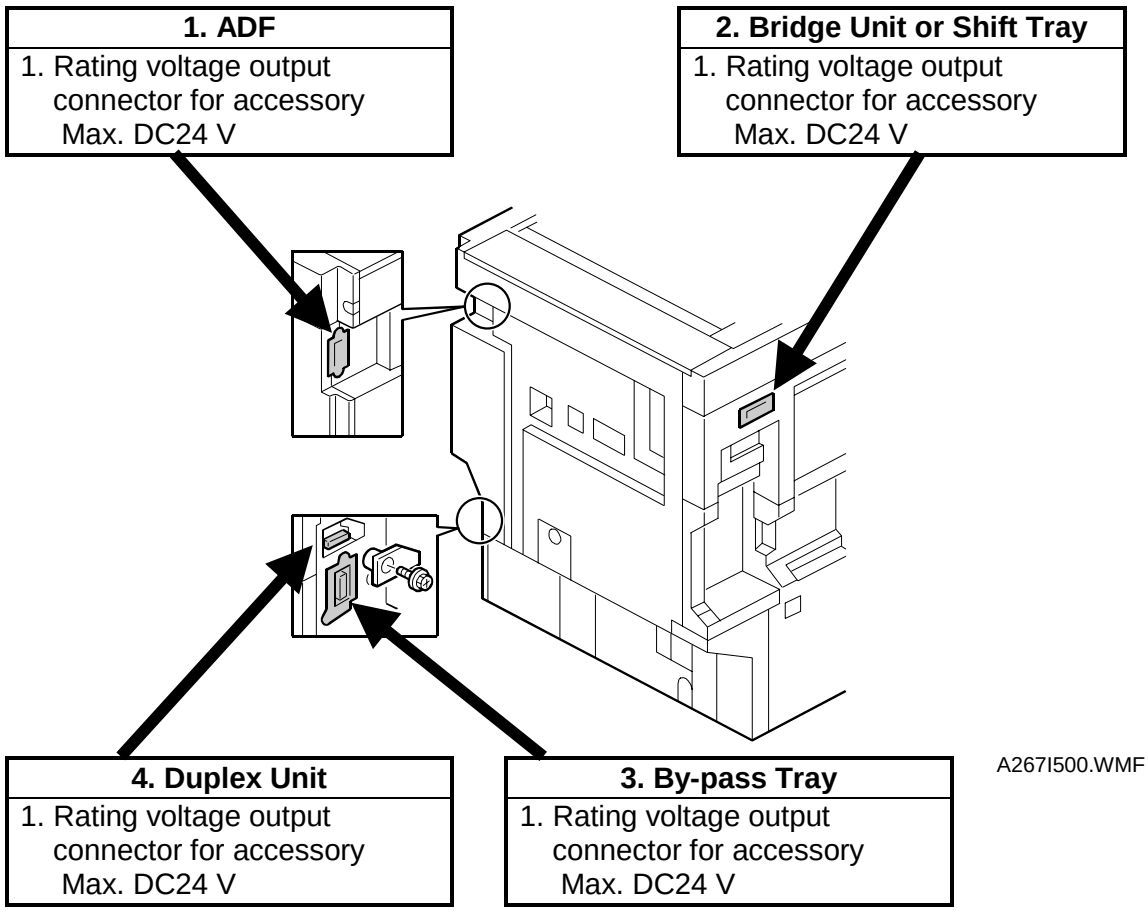
3.2 COPIER INSTALLATION

3.2.1 POWER SOCKETS FOR PERIPHERALS

⚠CAUTION

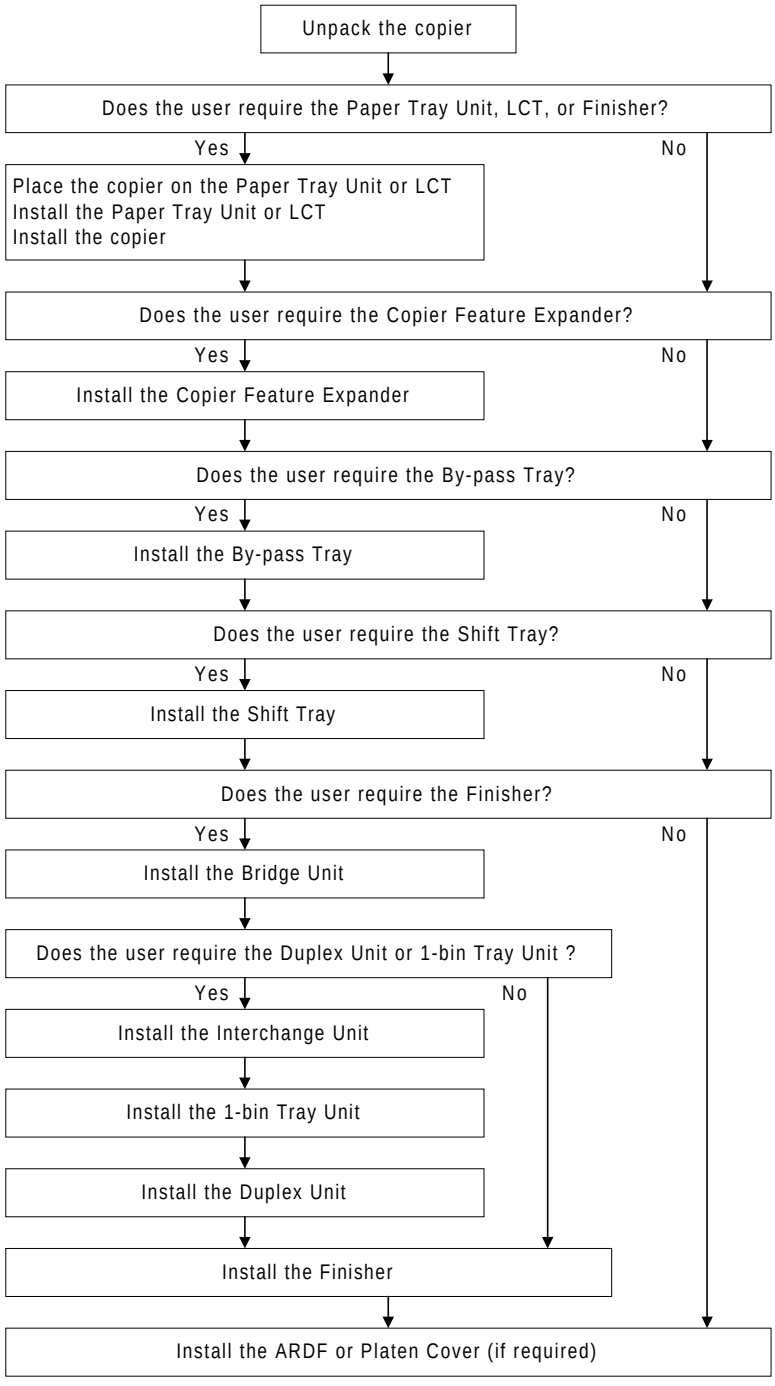
Rating voltage for peripherals.

Make sure to plug the cables into the correct sockets.


1. ADF
1. Rating voltage output connector for accessory Max. DC24 V
2. Bridge Unit or Shift Tray
1. Rating voltage output connector for accessory Max. DC24 V
4. Duplex Unit
1. Rating voltage output connector for accessory Max. DC24 V
3. By-pass Tray
1. Rating voltage output connector for accessory Max. DC24 V
A267I500.WMF

3.2.2 INSTALLATION FLOW CHART

The following flow chart shows how to install the optional units more efficiently.


Unpack the copier
Does the user require the Paper Tray Unit, LCT, or Finisher?
Yes
No
Place the copier on the Paper Tray Unit or LCT
Install the Paper Tray Unit or LCT
Install the copier
Does the user require the Copier Feature Expander?
Yes
No
Install the Copier Feature Expander
Does the user require the By-pass Tray?
Yes
No
Install the By-pass Tray
Does the user require the Shift Tray?
Yes
No
Install the Shift Tray
Does the user require the Finisher?
Yes
No
Install the Bridge Unit
Does the user require the Duplex Unit or 1-bin Tray Unit ?
Yes
No
Install the Interchange Unit
Install the 1-bin Tray Unit
Install the Duplex Unit
Install the Finisher
Install the ARDF or Platen Cover (if required)

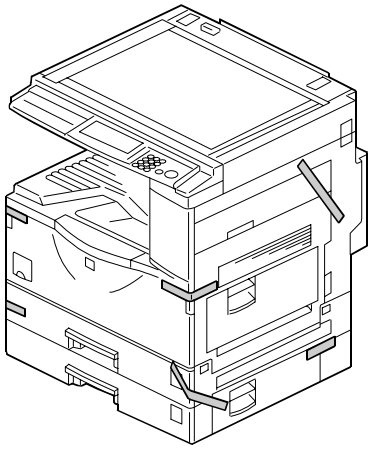
A265I512.WMF

3.2.3 ACCESSORY CHECK

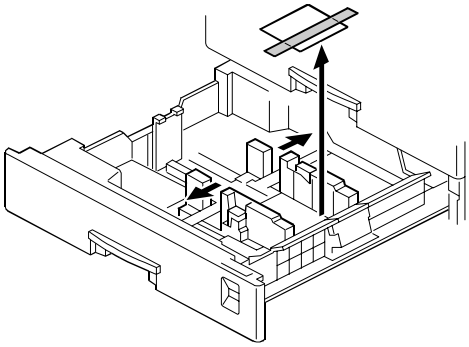
Check the quantity and condition of the accessories in the box against the following list:

No.	Description	Q'ty
1	Paper Tray Decal	1
2	Model Name Decal (-15 and -22 machine)	1
3	NECR	1
4	End Fence	1
5	Operating Instructions – System Setting	1
6	Operating Instructions – Copy Reference	1
7	Operating Instructions – Copy Quick Guide	1

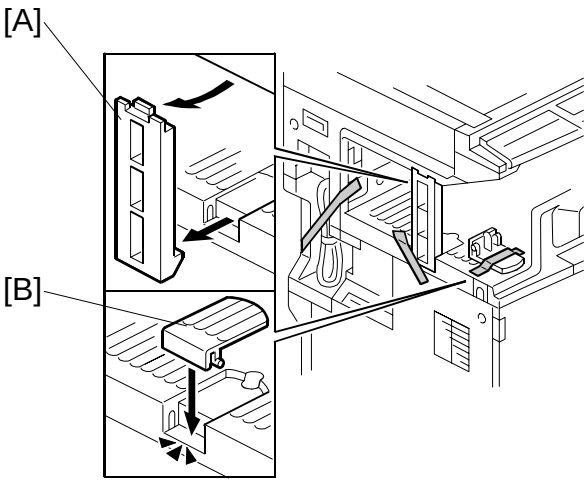
3.2.4 INSTALLATION PROCEDURE



A267I101.WMF



A267I502.WMF



A267I501.WMF

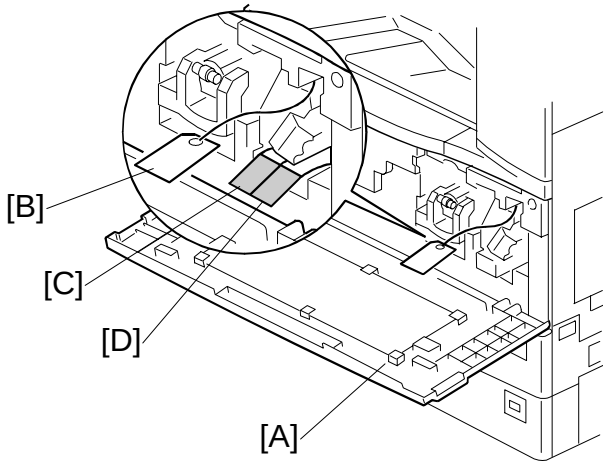
⚠CAUTION

Unplug the machine power cord before starting the following procedure.

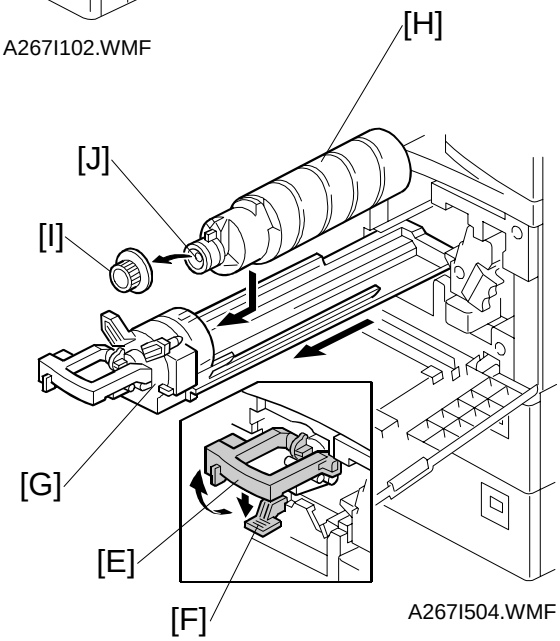
If the optional paper tray or the optional LCT is going to be installed now, put the copier on the paper tray unit or the LCT first, then install these options, then install the copier.

NOTE: Keep the shipping retainers after installing the machine. They will be reused if the machine is moved to another location in the future.

1. Remove the tapes and the shipping retainer [A] on the exterior of the copier.
2. Install the end fence [B].

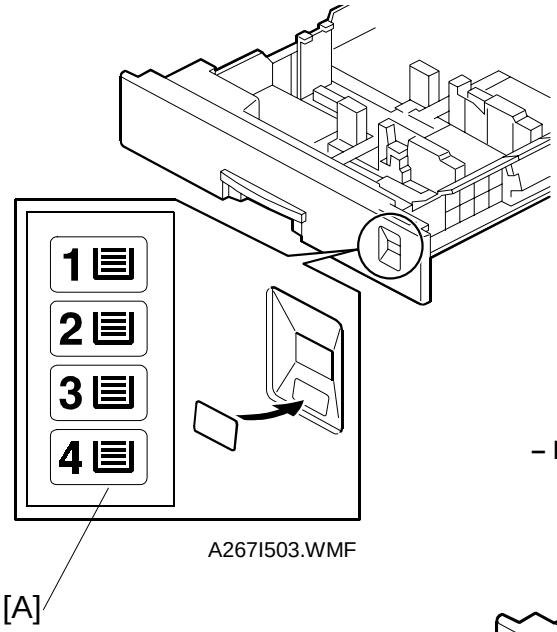


A267I102.WMF



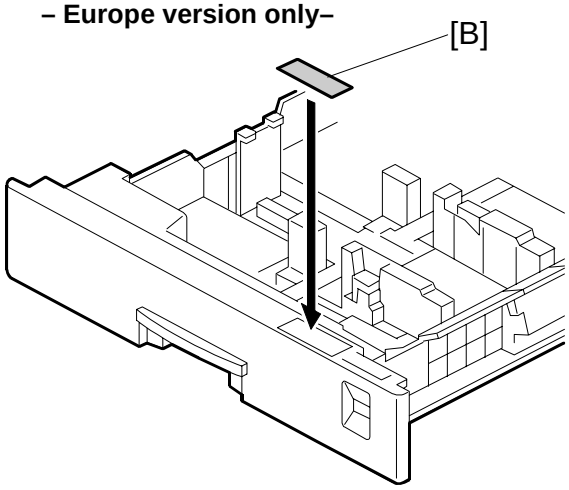
A267I504.WMF

3. Open the front cover [A].
4. Remove the red tag [B] and toner seal [C], then peel the sealing tape [D] off to install the developer.
5. Raise the toner bottle holder lever [E], push lever [F] down, and pull the toner bottle holder [G] out.
6. Shake the toner bottle [H] well.
   NOTE: Do not remove the toner bottle cap [I] until after shaking.
7. Unscrew the bottle cap [I] and insert the bottle into the holder.
   NOTE: Do not touch the inner bottle cap [J].
8. Reposition the holder and press down the holder lever to secure the bottle.



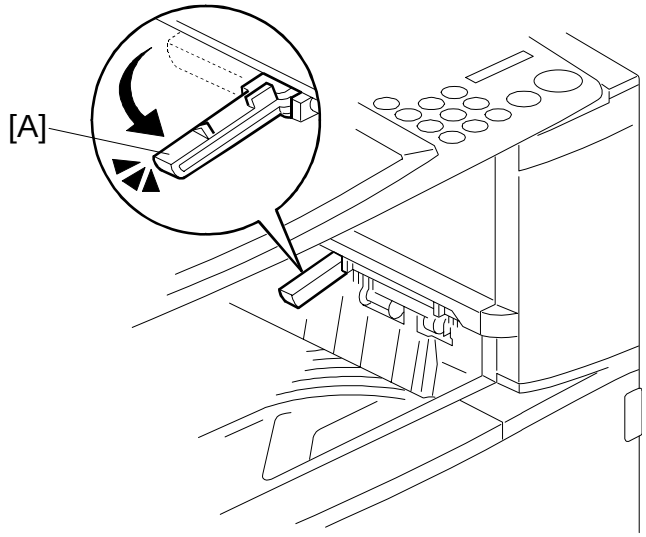
A267I503.WMF

– Europe version only–



A265I511.WMF

9. Pull the paper tray out and turn the paper size dial to select the appropriate size. Adjust the side guides and end guide to match the paper size.
   NOTE: To move the side guides, first pull out the tray fully, then push down the green lock at the rear of the tray.
10. Attach the appropriate paper tray number decal [A] to the paper tray.
    NOTE: Paper tray number decals are also used for the optional paper tray or the optional LCT. Keep any remaining decals for use with these optional units.
11. **European version only:** Attach the special paper decal [B] to the 2nd paper tray, as shown.



A267I105.WMF

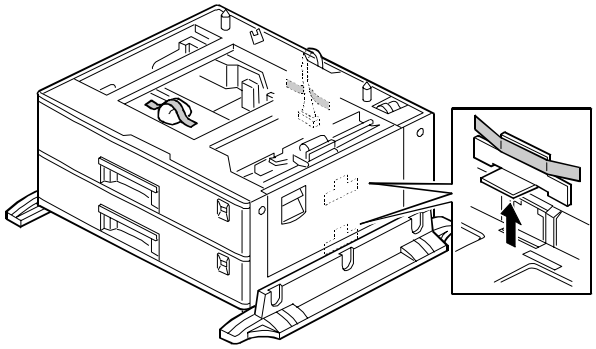
12. **If the optional bridge unit will not be installed:** Swing the sensor feeler [A] out.
13. Install the optional ARDF or the optional platen cover (see ARDF Installation or Platen Cover Installation).
14. Plug in the machine and turn the main power switch on. The machine automatically performs TD sensor initial setting (approximately 45 seconds).
15. Select the correct display language using SP 5-808 or UP mode (Language).
16. Check the copy quality and copying functions.
17. Initialize the electrical total counter using SP7-825, depending on the service contract type.
    NOTE: Select 1, then press the Original Type and OK keys at the same time. If the reset is successful, the beeper sounds 5 times.

3.3 PAPER TRAY UNIT INSTALLATION

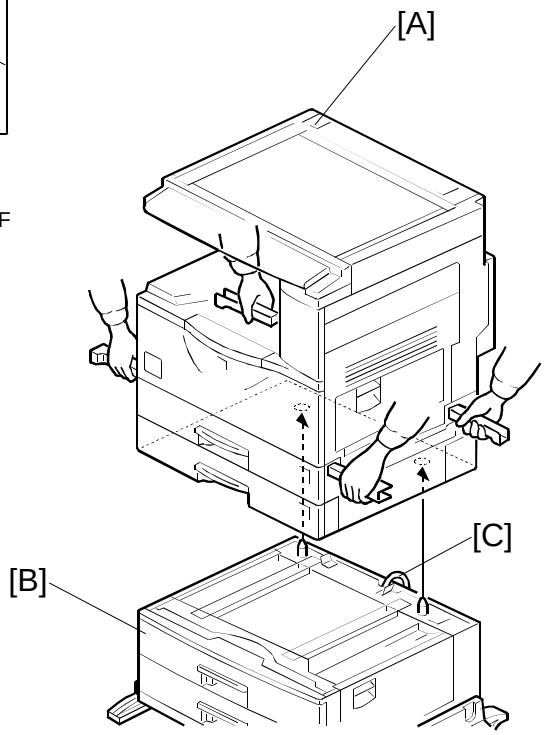
3.3.1 ACCESSORY CHECK

Check the quantity and condition of the accessories against the following list.

No.	Description	Q'ty
1	Securing Bracket	2
2	Screw – M4x10	4



A860I603.WMF

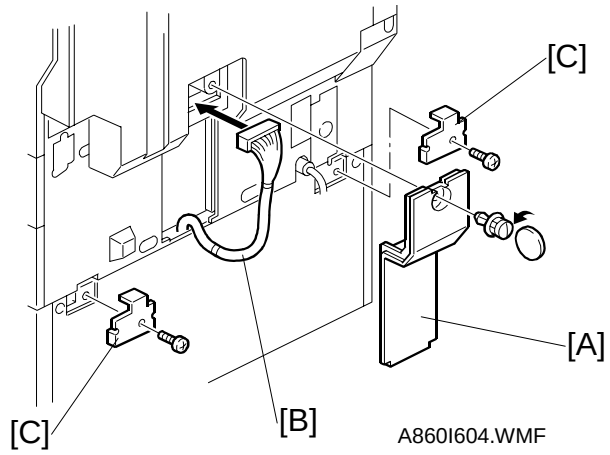


A860I601.WMF

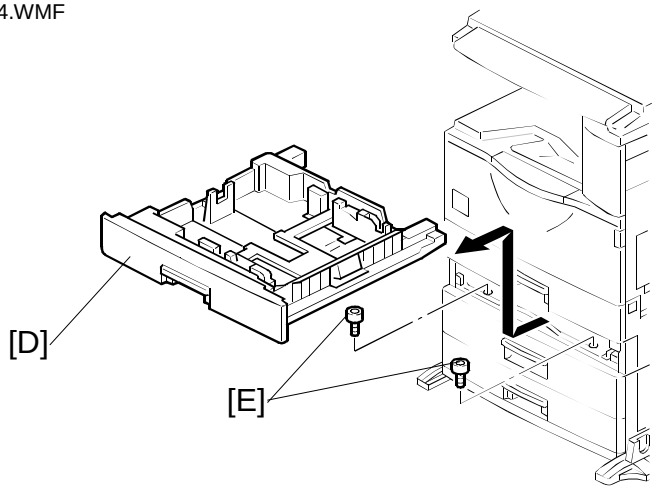
⚠CAUTION

Unplug the machine power cord before starting the following procedure.

1. Remove the strips of tape.
2. Set the copier [A] on the paper tray unit [B].
   NOTE: When installing the copier, be careful not to pinch the cable [C].

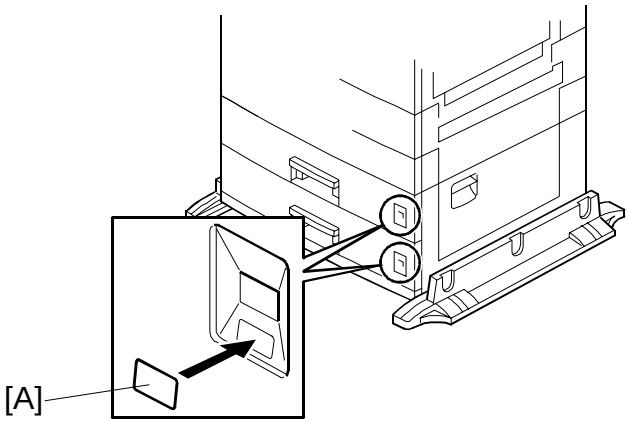


A860I604.WMF

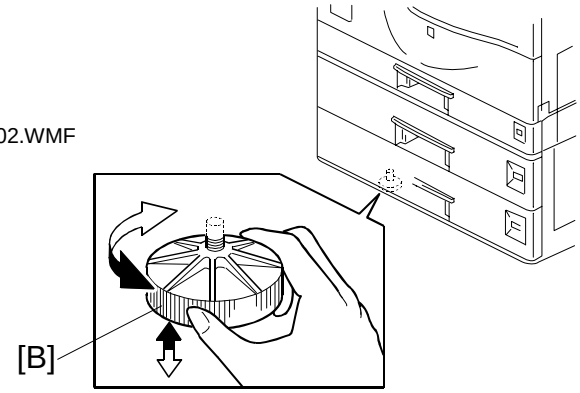


A860I600.WMF

3. Remove the connector cover [A] (1 screw).
4. Connect the cable [B] to the copier, as shown.
5. Attach a securing bracket [C] to each side of the paper tray unit, as shown (1 screw each).
6. Re-install the connector cover.
7. Remove the 2nd paper tray [D] and secure the paper tray unit with two screws [E].



A860I602.WMF



A860I002.WMF

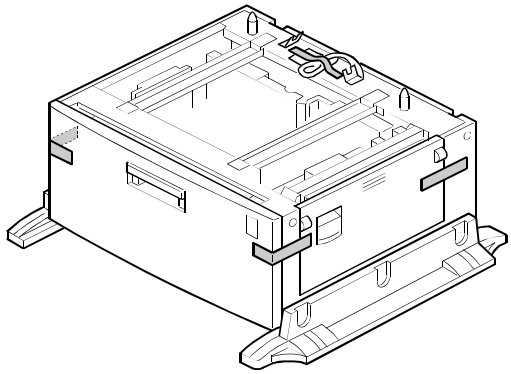
8. Reinstall the 2nd paper tray and attach the appropriate paper tray number decal [A] to the paper tray.
   NOTE: The paper tray number decal is in the accessory box for the main copier.
9. Rotate the adjuster [B] until the machine cannot be pushed across the floor.
10. Load paper into the paper trays and select the proper paper size.
11. Turn on the main switch.
12. Check the machine's operation and copy quality.

3.4 LCT INSTALLATION

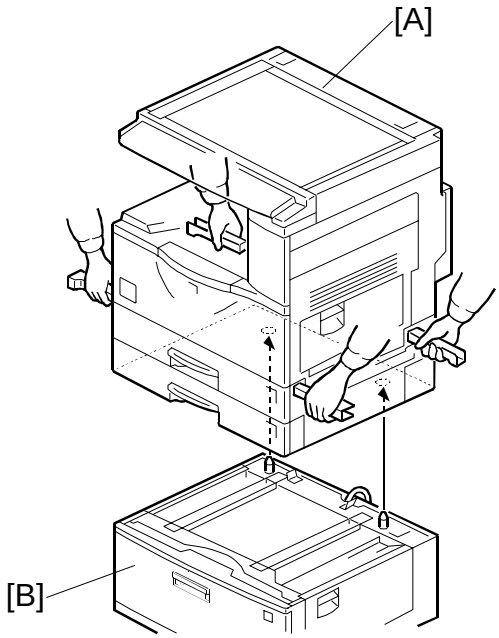
3.4.1 ACCESSORY CHECK

Check the quantity and condition of the accessories against the following list.

No.	Description	Q'ty
1	Securing Bracket	2
2	Screw – M4x10	4
3	Paper Size Decal	1



A862I500.WMF

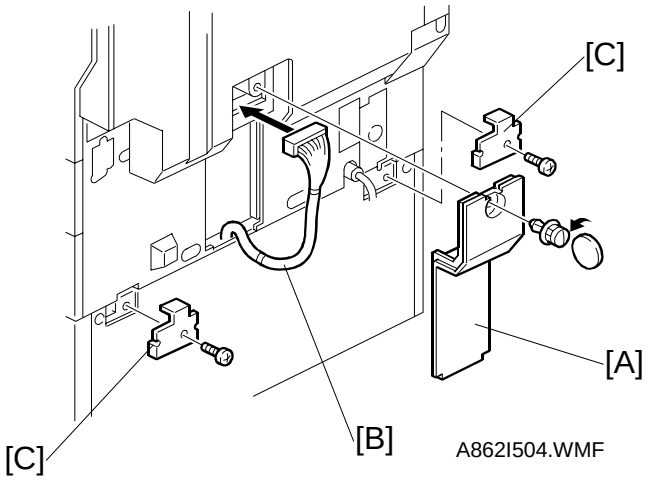


A862I505.WMF

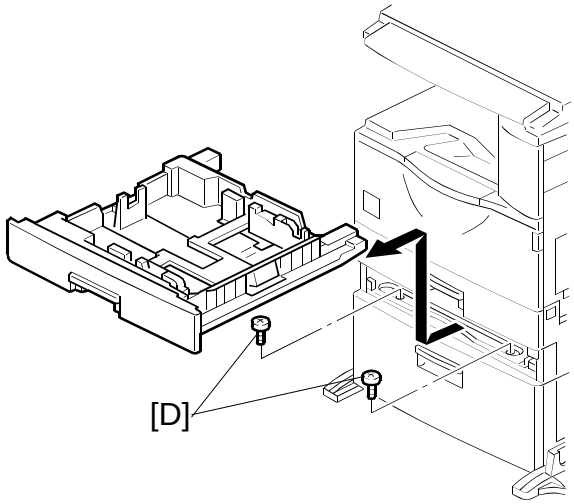
⚠CAUTION

Unplug the machine power cord before starting the following procedure.

1. Remove the strips of tape.
2. Set the copier [A] on the LCT [B].
   NOTE: When installing the copier, be careful not to pinch the cable [C].

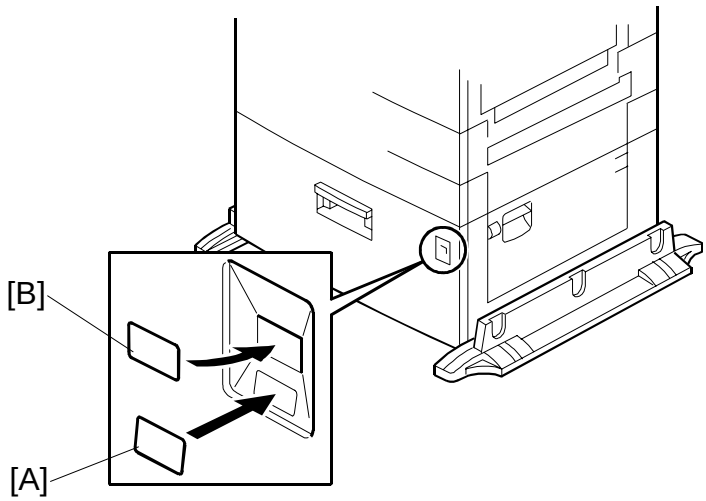


A862I504.WMF



A862I501.WMF

3. Remove the connector cover [A] (1 screw).
4. Connect the cable [B] to the copier, as shown.
5. Attach a securing bracket [C] to each side of the LCT, as shown (1 screw each).
6. Re-install the connector cover.
7. Remove the 2nd paper tray and secure the LCT with two screws [D].



A862I502.WMF

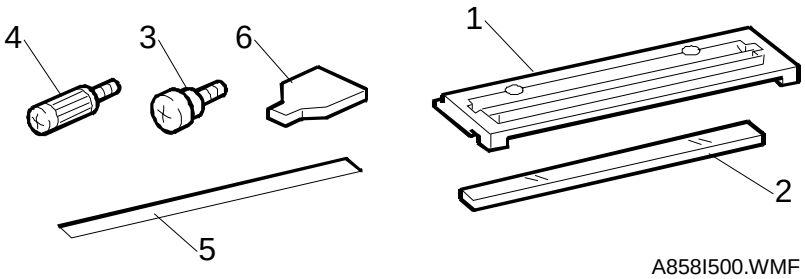
8. Load paper into the LCT.
9. Reinstall the 2nd paper tray and attach the appropriate paper tray number decal [A] and paper size decal [B] to the LCT.
   NOTE: The paper tray number decal is in the accessory box for the main copier.
10. Turn on the main switch.
11. Check the machine's operation and copy quality.

3.5 AUTO REVERSE DOCUMENT FEEDER INSTALLATION

3.5.1 ACCESSORY CHECK

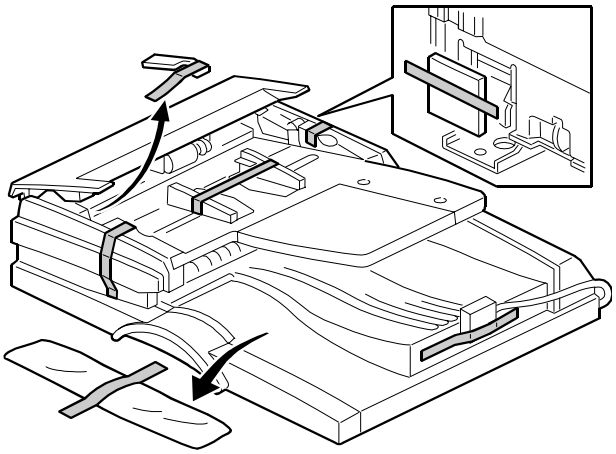
Check the quantity and condition of the accessories against the following list.

No.	Description	Q'ty
1	Scale Guide	1
2	DF Exposure Glass	1
3	Stud Screw	2
4	Knob Screw	2
5	Original Size Decal	2
6	Screwdriver Tool	1



A858I500.WMF

3.5.2 INSTALLATION PROCEDURE

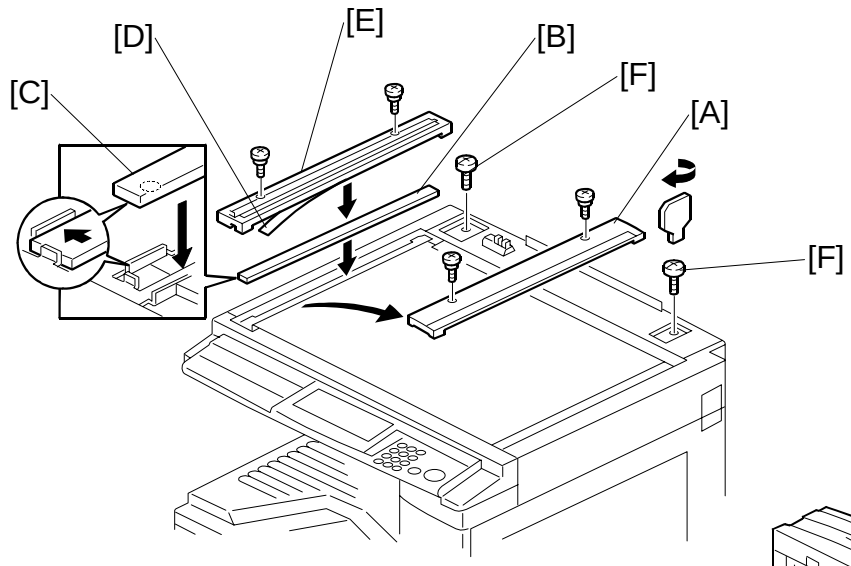


A858I101.WMF

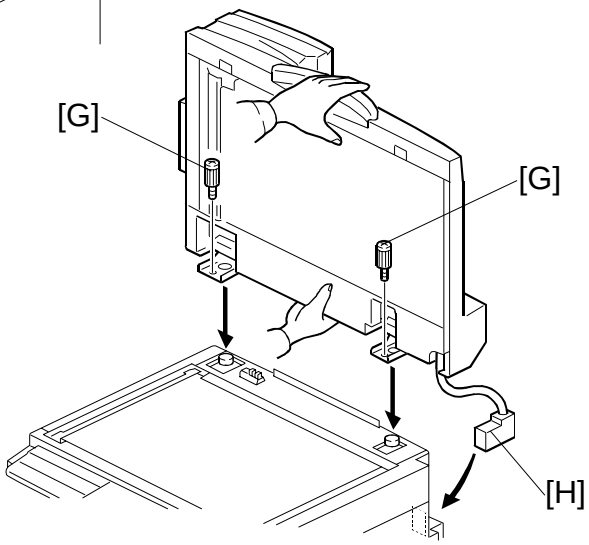
⚠CAUTION

Unplug the copier power cord before starting the following procedure.

1. Remove the strips of tape.

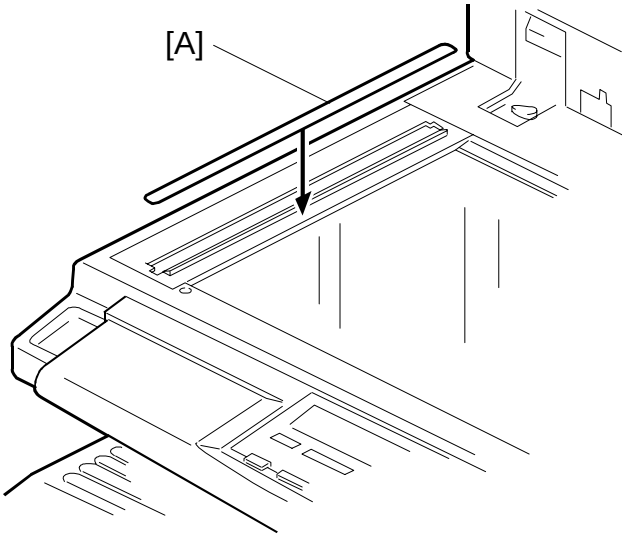


A858I103.WMF



A858I104.WMF

2. Remove the left scale [A] (2 screws).
3. Place the DF exposure glass [B] on the glass holder.
   NOTE: When installing the DF exposure glass, make sure that the white point [C] is on the lower front side of the glass, as shown.
4. Peel off the backing [D] of the double-sided tape attached to the rear side of the scale guide [E], then install it (2 screws removed in step 2).
5. Install the two stud screws [F].
6. Mount the DF on the copier, then slide the DF to the front.
7. Secure the DF unit with two screws [G].
8. Connect the cable [H] to the copier.



A858I501.WMF

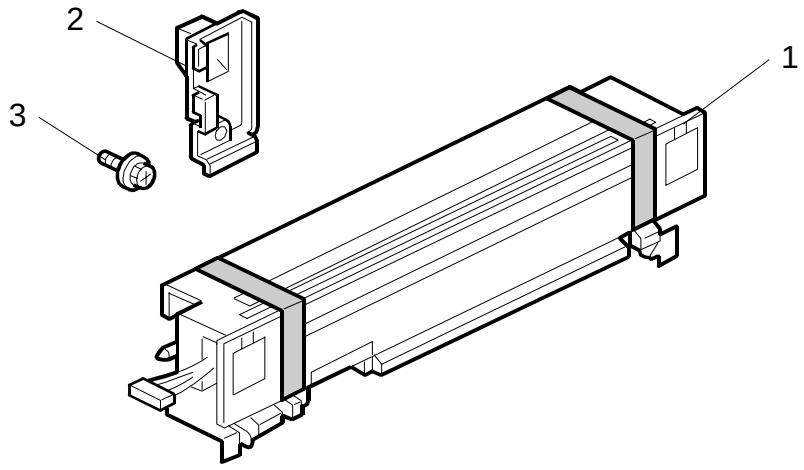
9. Attach the appropriate scale decal [A] as shown.
10. Turn the main power switch on. Then check if the document feeder works properly.
11. Make a full size copy. Then check to make sure the side-to-side and leading edge registrations are correct. If they are not, adjust the side-to-side and leading edge registrations.

3.6 INTERCHANGE UNIT INSTALLATION

3.6.1 COMPONENT CHECK

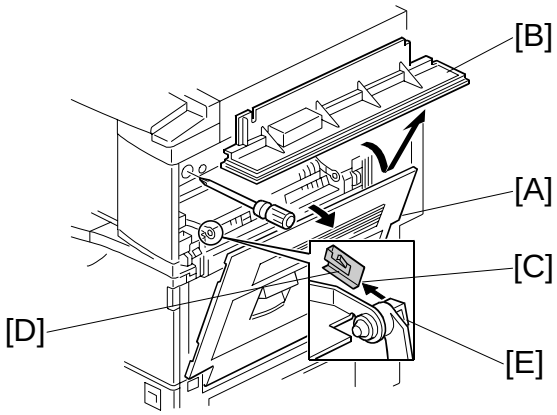
Check the quantity and condition of the components against the following list.

No.	Description	Q'ty
1	Interchange Unit	1
2	Connector Cover	1
3	Tapping Screw M3x8	1

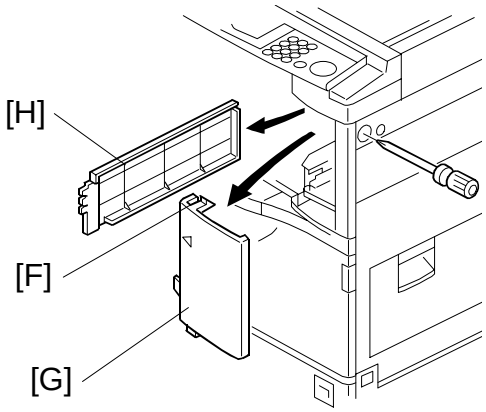


B300I101.WMF

3.6.2 INSTALLATION PROCEDURE



B300I503.WMF



B300I502.WMF

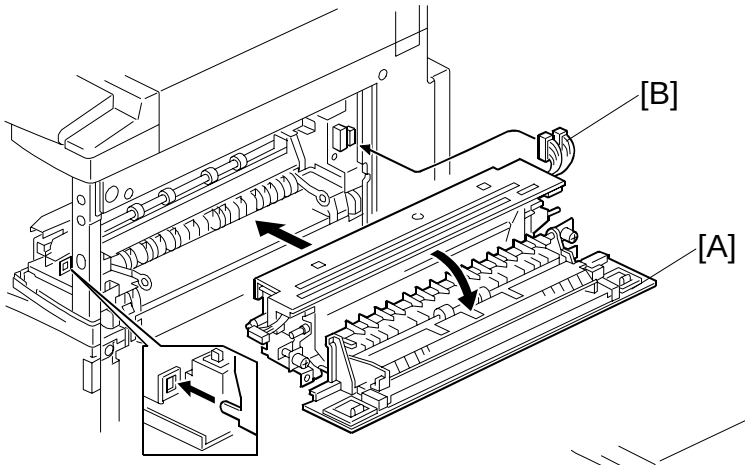
⚠CAUTION

Unplug the copier power cord before starting the following procedure.

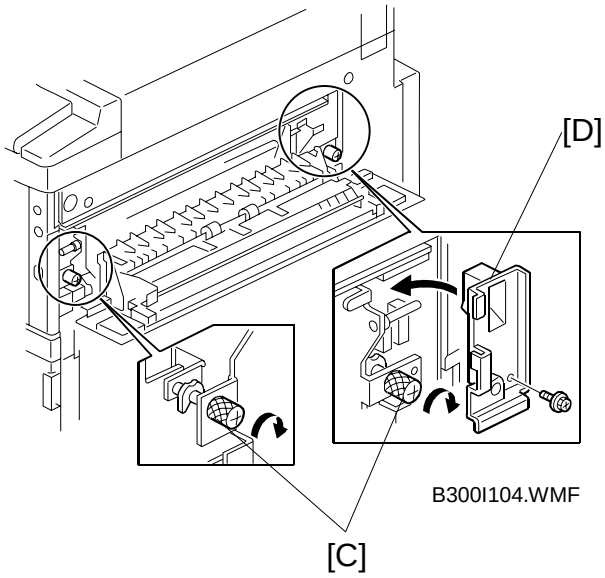
1. Remove all tapes.
2. Open the right cover [A] of the copier.
3. Open cover [B]
4. Remove the metal clip [C].
   NOTE: To remove the clip, push the small tab [D] on the clip into the slot [E], then the clip can be removed.
5. Remove the cover [B].

If the optional 1-bin tray unit will be installed, do steps 6 and 7.

6. Loosen the screw, push down tab [F] with a screwdriver, and remove the front right cover [G].
7. Slide out the exit cover [H].



B300I103.WMF



B300I104.WMF

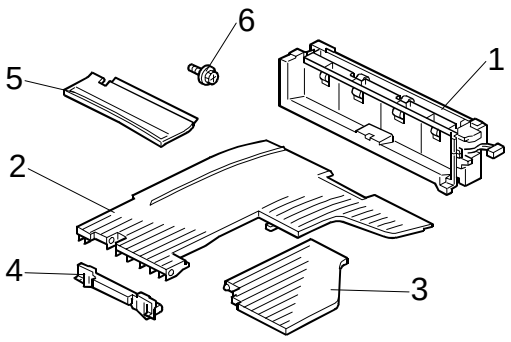
8. Open the cover [A] of the interchange unit.
9. Install the interchange unit (2 connectors [B].)
10. Secure the interchange unit with the knob screws [C].
11. Attach the connector cover [D] (1 screw).

3.7 1-BIN TRAY UNIT INSTALLATION

3.7.1 COMPONENT CHECK

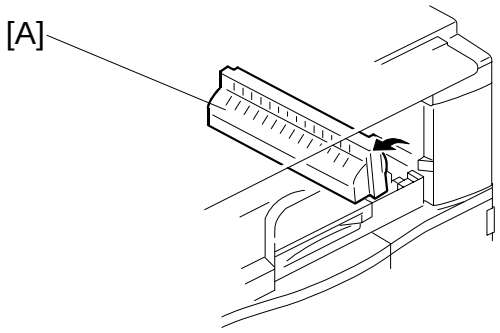
Check the quantity and condition of the components against the following list.

No.	Description	Q'ty
1	1-Bin Tray Unit	1
2	Tray	1
3	Sub-Tray	1
4	Tray Guide	1
5	Paper Guide	1
6	Tapping Screw M3x8	1



A898I101.WMF

3.7.2 INSTALLATION PROCEDURE



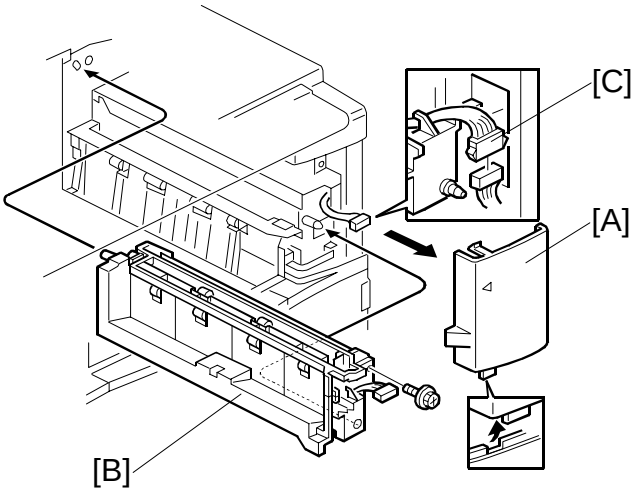
A898I501.WMF

⚠CAUTION

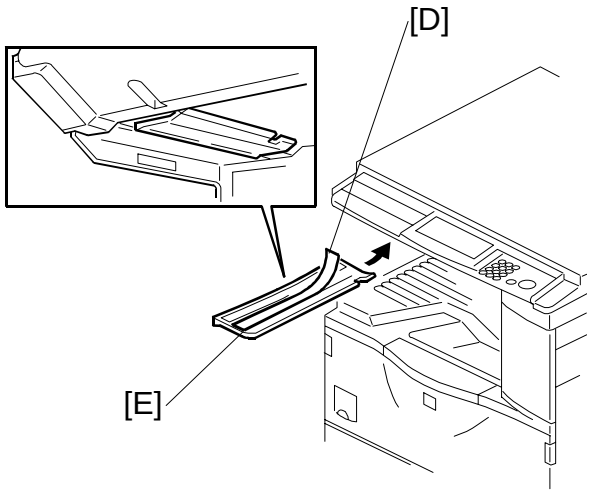
Unplug the copier power cord before starting the following procedure.

NOTE: Before installing this 1-bin tray unit, the optional interchange unit (B300) must be installed.

1. Remove all tapes.
2. If the optional bridge unit (A897) has been installed, open the right jam removal cover [A] of the bridge unit.
   If the optional bridge unit is not installed, skip this step.

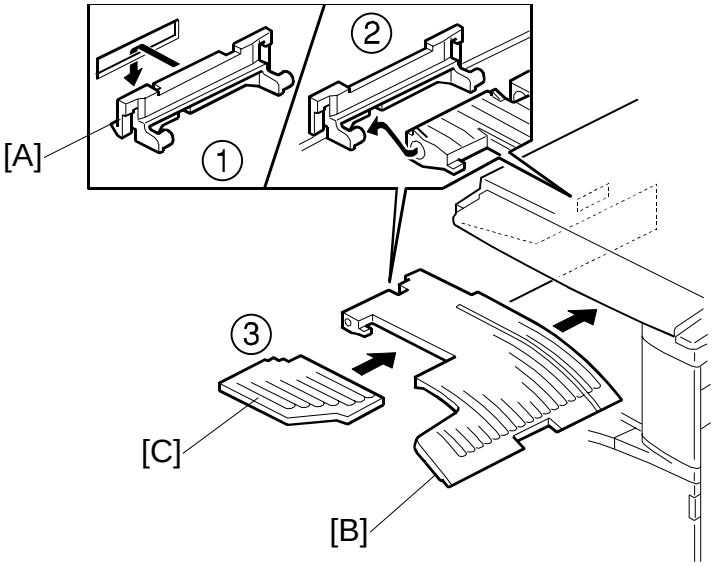


A898I500.WMF



A898I103.WMF

3. If the front right cover [A] is installed, remove it.
4. Install the 1-bin tray unit [B] (1 screw).
5. Connect the connector [C].
6. Reinstall the front right cover.
7. Peel off the backing [D] of the double-sided tape attached to the paper guide [E]. Then attach the paper guide to the underside of the scanner unit as shown.



A898I105.WMF

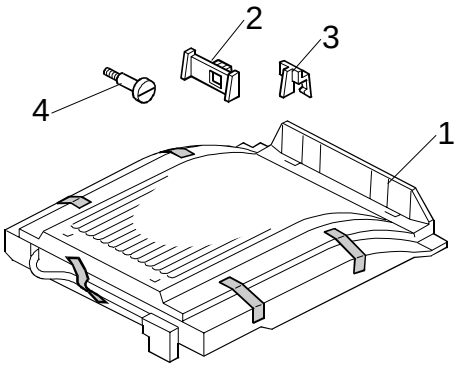
8. Install the tray guide [A].
9. Install the tray [B].
10. Install the sub-tray [C].
11. Turn on the main power switch and check the 1-bin tray unit operation.

3.8 SHIFT TRAY

3.8.1 COMPONENT CHECK

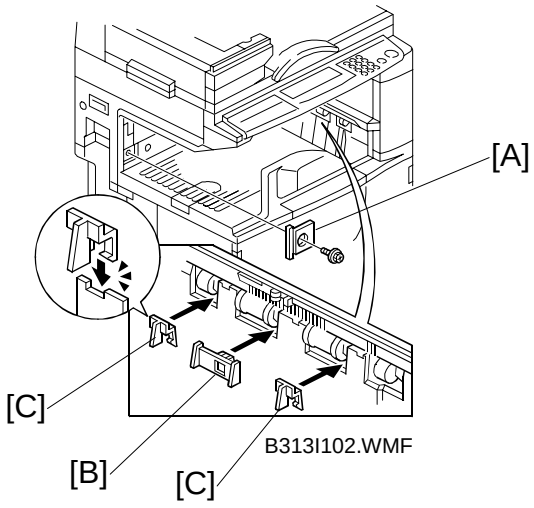
Check the quantity and condition of the components against the following list.

No.	Description	Q'ty
1	Shift Tray Unit	1
2	Paper Guide - Large	1
3	Paper Guide - Small	2
4	Stepped Screw	1



B313I101.WMF

3.8.2 INSTALLATION PROCEDURE

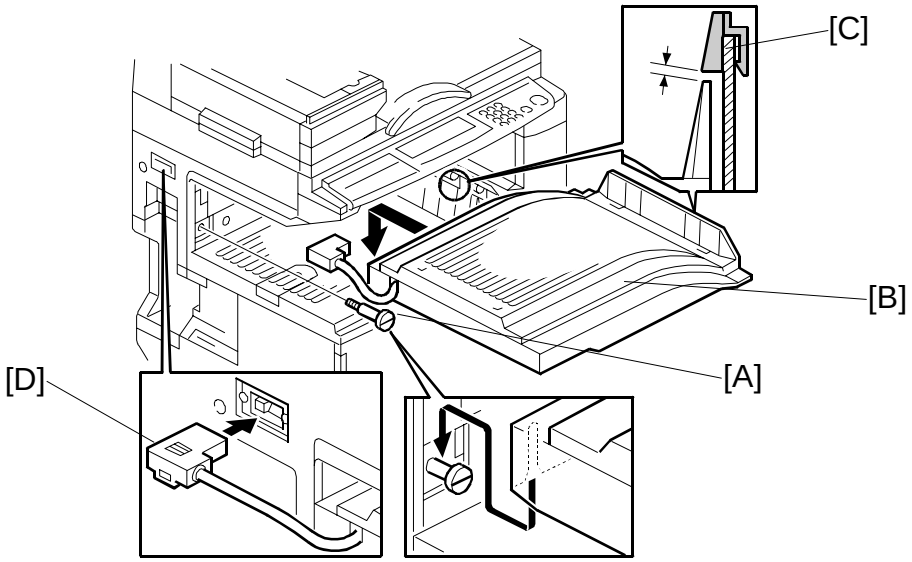


B313I102.WMF

⚠CAUTION

Unplug the copier power cord before starting the following procedure.

1. Remove all tapes.
2. Remove the plate [A] (1 screw).
3. Install the large paper guide [B] and two small paper guides [C], as shown.



B313I103.WMF

4. Install the stepped screw [A].
5. Install the shift tray unit [B], as shown.

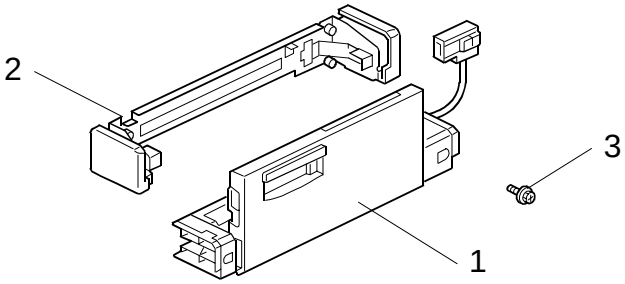
   NOTE: 1) Set the shift tray on the stepped screw.
   2) The shift tray must be installed under the paper guide [C] installed in step 3.
6. Connect the cable [D] to the copier.
7. Turn on the main power switch. Then select the shift tray using the UP mode "2. Copier – 3. Input/Output – 6. Sort – Shift Sort".
8. Check the shift tray operation.

3.9 BY-PASS FEED UNIT INSTALLATION

3.9.1 COMPONENTS CHECK

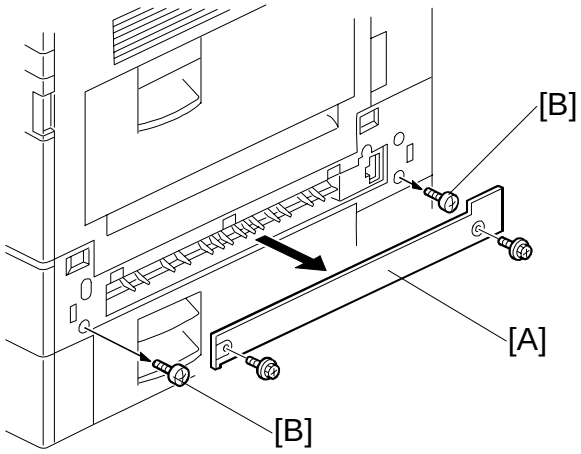
Check the quantity and condition of the components against the following list.

No.	Description	Q'ty
1	By-pass Tray Unit	1
2	Unit Holder	1
3	Tapping Screw	2



A899I101.WMF

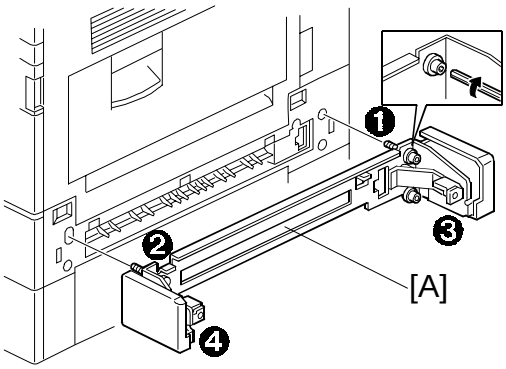
3.9.2 INSTALLATION PROCEDURE



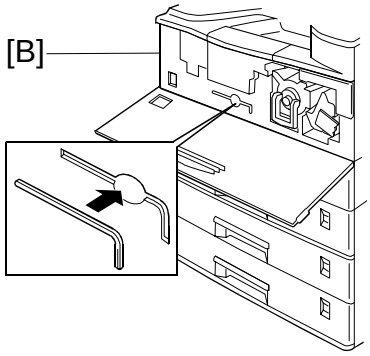
A899I102.WMF

⚠CAUTION
Unplug the copier power cord before starting the following procedure.

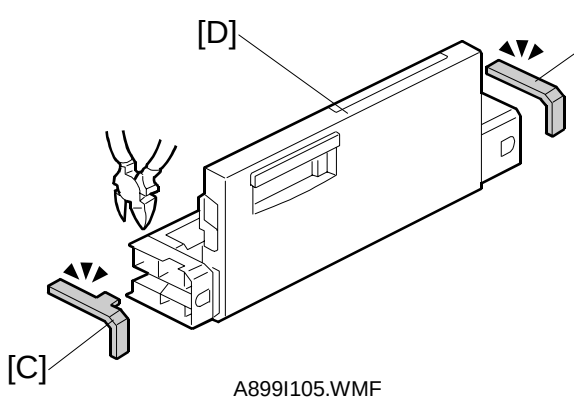
1. Remove all tapes.
2. Remove the entrance cover [A] (2 screws) and two screws [B].



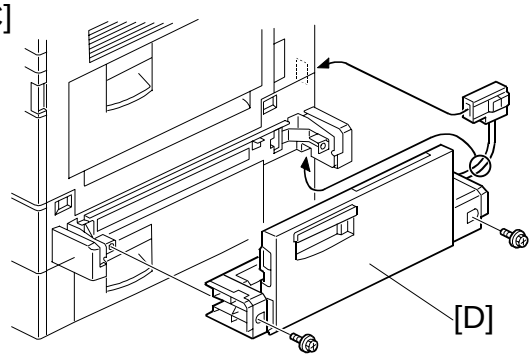
A899I103.WMF



A896I500.WMF



A899I105.WMF



A899I104.WMF

3. Install the unit holder [A] using the Allen key (4 set screws).

NOTE: 1) Make sure that the four screws are tightened in the proper order, as shown above. Otherwise, when the optional duplex unit (A896) is installed, it will not properly lock in place.
2) After securing the unit, store the Allen key in the inner cover [B] for future use.

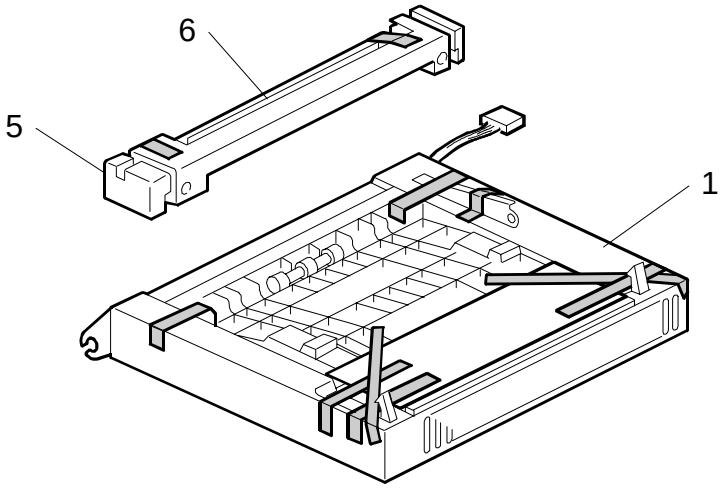
4. **If the optional duplex unit (A896) will be installed:** Remove the indicated parts [C] of the by-pass tray unit [D].
5. Install the by-pass tray unit (2 screws, 1 connector).
6. Turn the main power switch on and check the by-pass tray function.
7. Make a copy from the by-pass tray. Then check the registration.

3.10 DUPLEX UNIT INSTALLATION

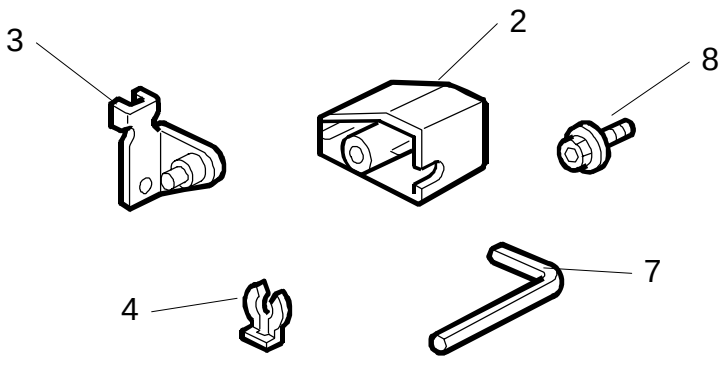
3.10.1 ACCESSORY CHECK

Check the quantity and condition of the accessories against the following list.

No.	Description	Q'ty
1	Duplex Unit	1
2	Connector Cover	1
3	Bracket	1
4	Clip	1
5	Unit Holder	1
6	Unit Holder Cover	1
7	Allen Key	1
8	Tapping Screw - M3x8	4

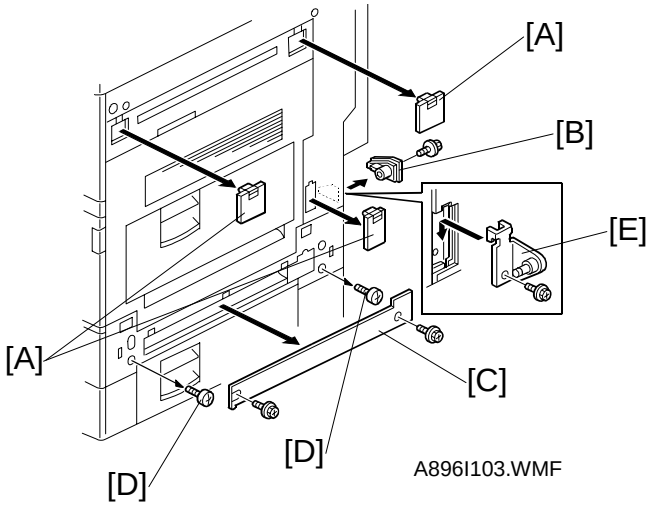


A896I101.WMF

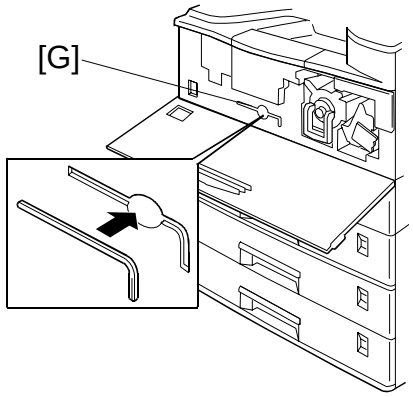


A896I102.WMF

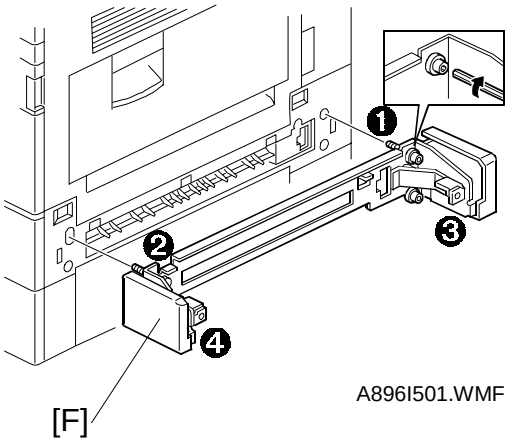
3.10.2 INSTALLATION PROCEDURE



A896I103.WMF



A896I500.WMF



A896I501.WMF

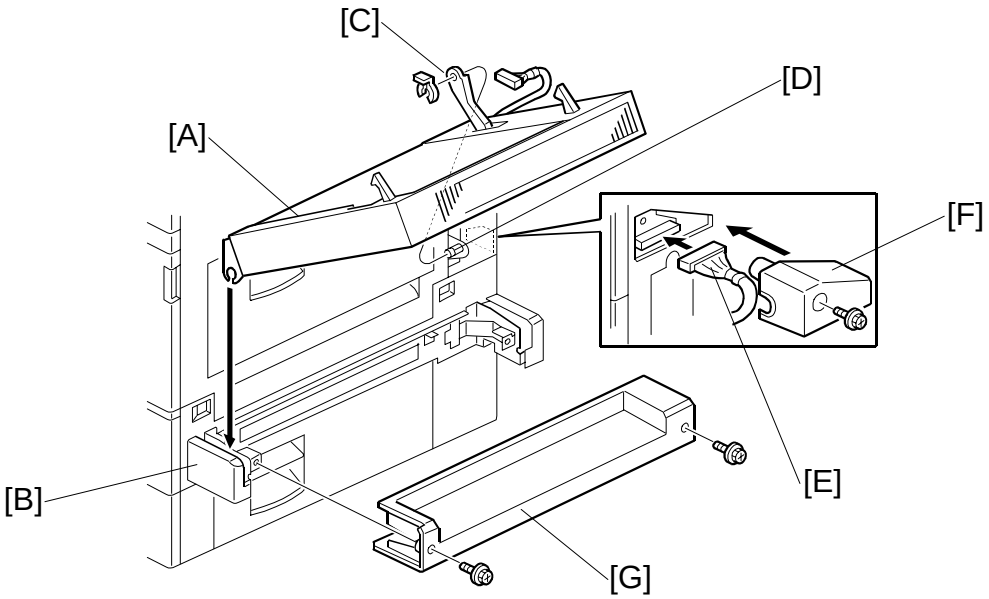
⚠CAUTION

Unplug the copier power cord before starting the following procedure.

NOTE: Before installing the duplex unit, the optional interchange unit (B300) must be installed.

1. Remove all tapes.
2. Remove three covers [A].
3. Remove the connector cover [B] (1 screw), the entrance cover [C] (2 screws; if the by-pass tray has not been installed), and two screws [D].
4. Install the bracket [E] (1 screw).
5. **If the by-pass tray has already been installed, skip this step:** Install the unit holder [F] using the Allen key (4 set screws).

NOTE: 1) Make sure that the four screws are tightened in the proper order, as shown above. Otherwise, the duplex unit will not properly lock in place.
2) After securing the unit, store the Allen key in the inner cover [G] for future use.



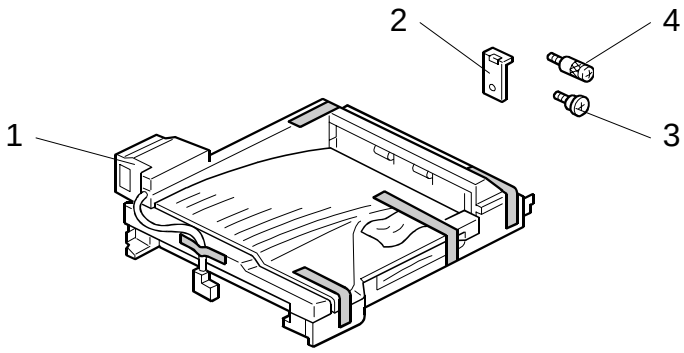
6. Set the duplex unit [A] on the unit holder [B] or on the by-pass tray unit if it has already been installed.
7. Attach the link [C] to the shaft [D] and secure it with the clip.
8. Connect the cable [E] and install the connector cover [F] (1 screw).
9. **If the by-pass tray has already been installed, skip this step:** Install the unit holder cover [G] (2 screws).
10. Turn on the main power switch and check the duplex unit function.

3.11 BRIDGE UNIT INSTALLATION

3.11.1 ACCESSORY CHECK

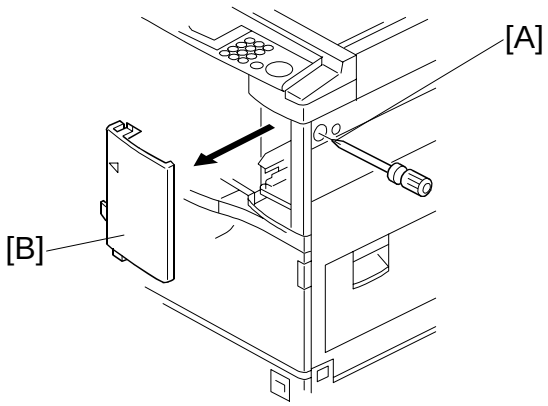
Check the quantity and condition of the accessories against the following list.

No.	Description	Q'ty
1	Bridge Unit	1
2	Securing Plate	1
3	Shoulder Screw	1
4	Knob Screw	1

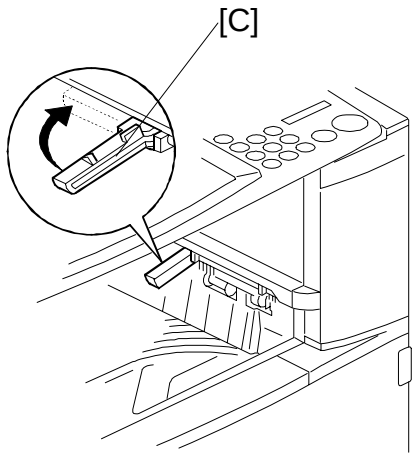


A897I101.WMF

3.11.2 INSTALLATION PROCEDURE



A897I501.WMF

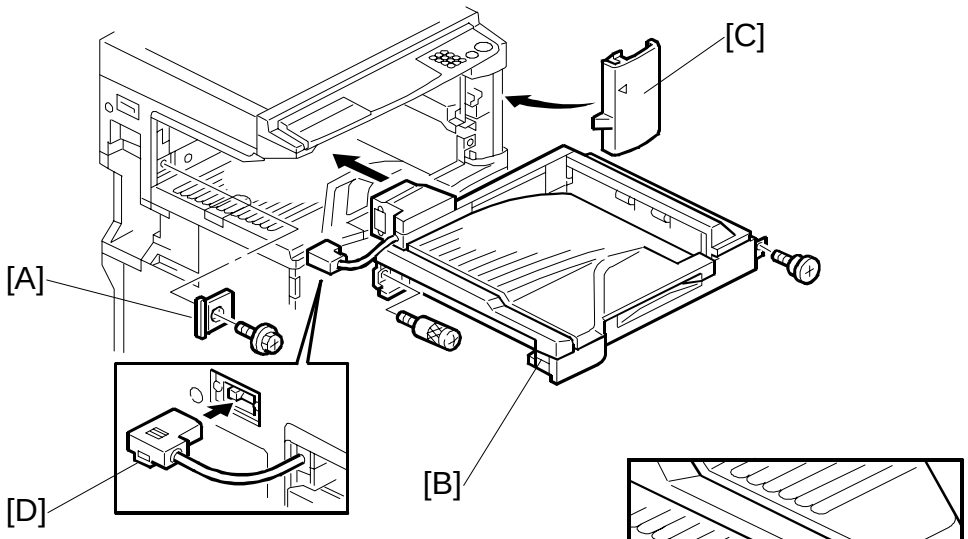


A897I500.WMF

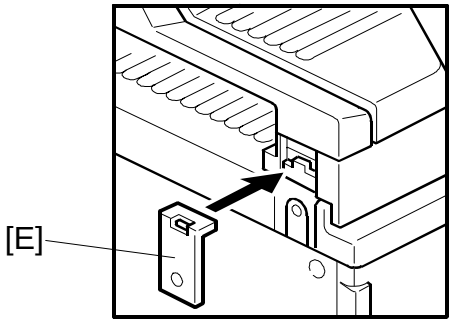
⚠CAUTION

Unplug the copier power cord before starting the following procedure.

1. Remove all tapes.
2. Loosen the screw [A] and remove the front right cover [B].
3. If the sensor feeler [C] is out, fold it away into the machine.



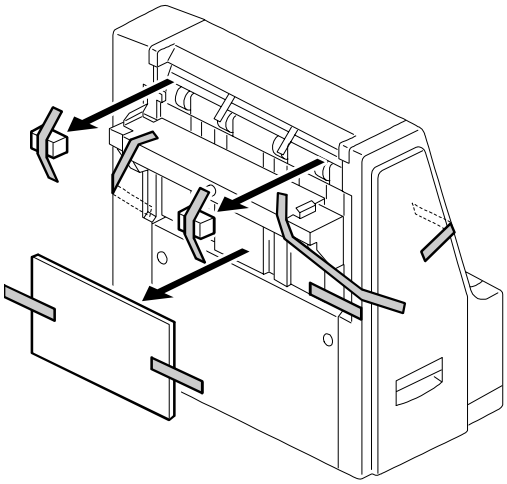
A897I102.WMF



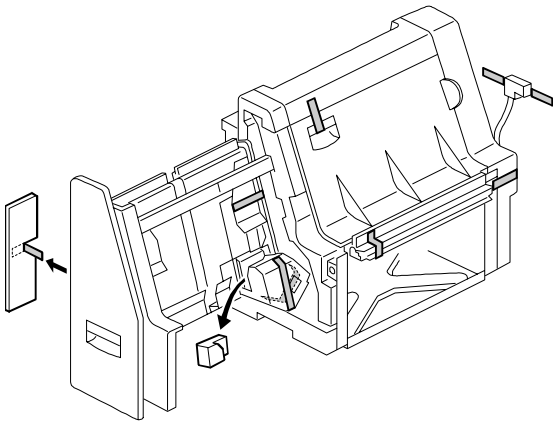
A897I103.WMF

4. Remove the cover [A] (1 screw).
5. Install the bridge unit [B] (1 shoulder screw, 1 knob screw).
6. Reinstall the front right cover [C].
7. Connect the cable [D] to the main machine.
8. Attach the securing plate [E], as shown.
   NOTE: Do not attach it with a screw; this is done when securing the front stand for the optional finisher.
9. Install the optional finisher (A681) (refer to the 1000-sheet finisher installation procedure).

3.12 1,000-SHEET FINISHER INSTALLATION



A681I503.WMF



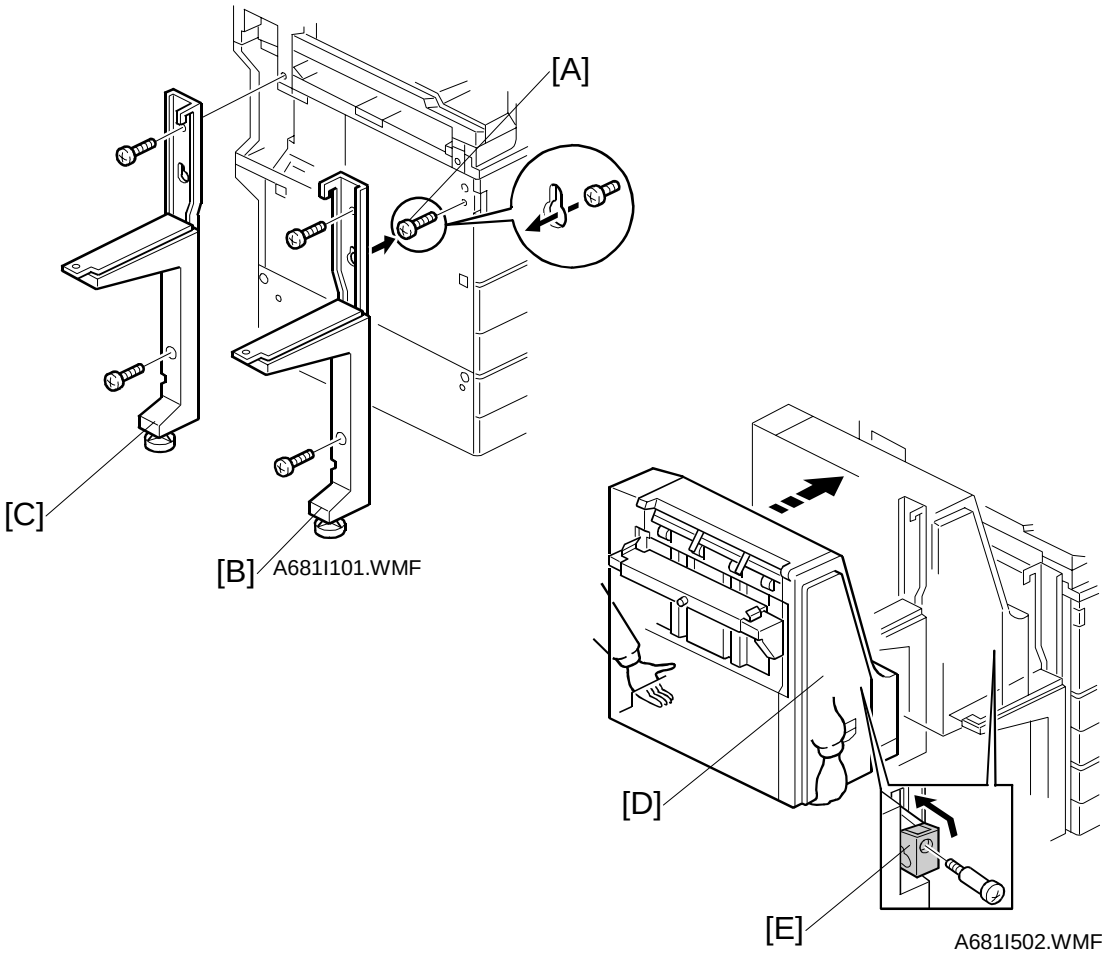
A681I504.WMF

⚠CAUTION

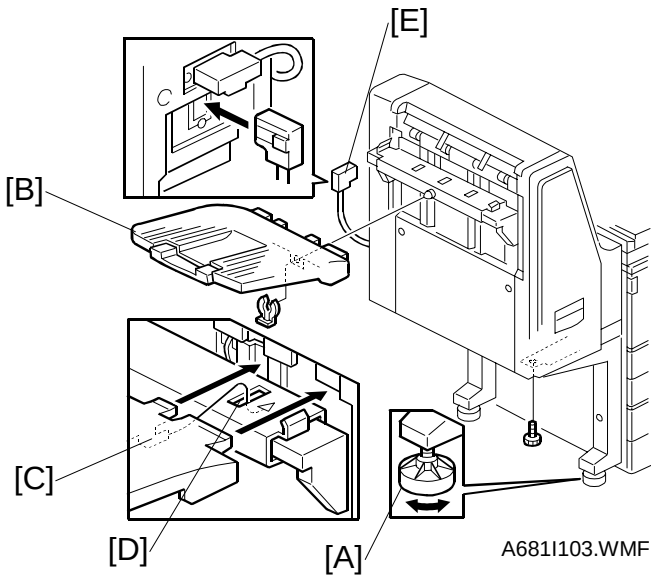
Unplug the main machine power cord before starting the following procedure.

NOTE: 1) If this finisher will be installed on the A265 or A267 copier or G038 printer, the following options must be installed before installing this finisher.
Bridge Unit (A897)
Paper Tray Unit (A860) or LCT (A862)
2) If this finisher will be installed on the A265 or A267 copier, the following option should also be installed.
Copier Memory Unit (A887)

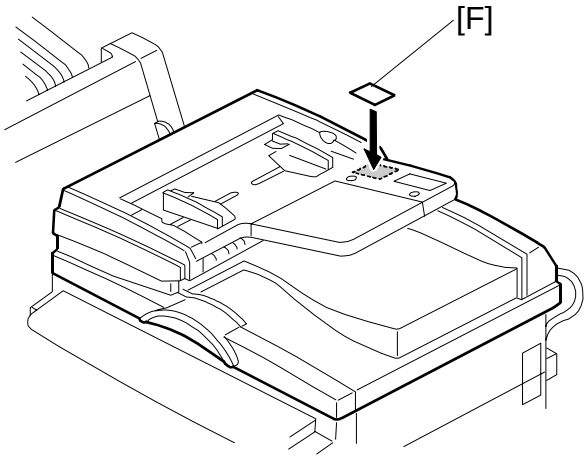
1. Unpack the finisher and remove the tapes.



2. Install screw [A] loosely.
3. Hang the front stand [B] on the screw which was installed in step 2.
4. Secure the front stand (3 screws, including screws [A]).
5. Install the rear stand [C] (2 screws).
6. Pull out the stapler unit [D].
7. Draw out the locking lever [E] (1 screw).
8. Align the finisher on the stands, and lock it in place by pushing the locking lever.
9. Secure the locking lever (1 screw) and push the stapler unit into the finisher.



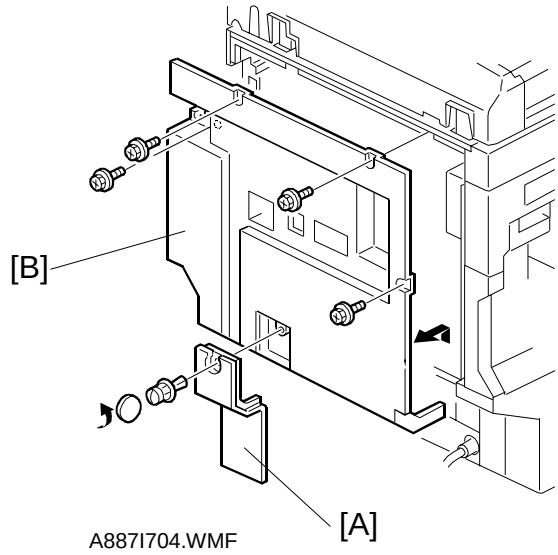
A681I103.WMF



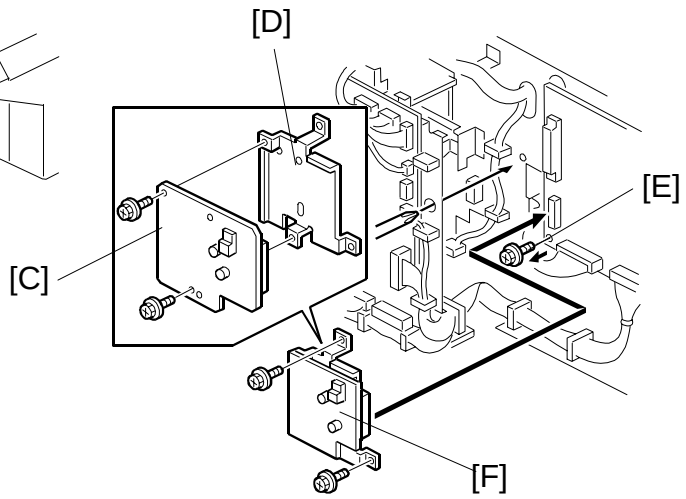
A681I501.WMF

10. Secure the finisher (1 screw).
11. Adjust the securing knobs [A] under the front and rear stand until the finisher is perpendicular to the floor.
12. Install the shift tray [B] (1 snap ring).
    NOTE: Make sure that the three pegs [C] fit into the slots [D] properly.
13. Connect the finisher cable [E] to the optional bridge unit.
14. Attach the staple position decal [F] to the ARDF as shown.
15. Turn on the main power switch and check the finisher operation.

3.13 COPIER FEATURE EXPANDER INSTALLATION



A887I704.WMF



A887I101.WMF

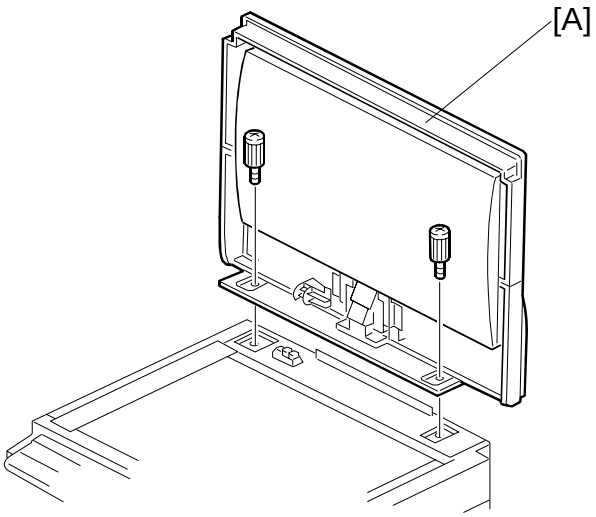
⚠CAUTION

Before installing this option, turn off the main switch and disconnect the power cord, the telephone line, and the network cable.

NOTE: If an expansion box was installed, remove it before starting the following procedure.

1. Remove the connector cover [A] and rear cover [B], as shown (5 screws).
2. Attach the board [C] to the bracket [D] (2 screws).
3. Remove screw [E].
4. Install the board assembly [F] (3 screws, including screw [E]).

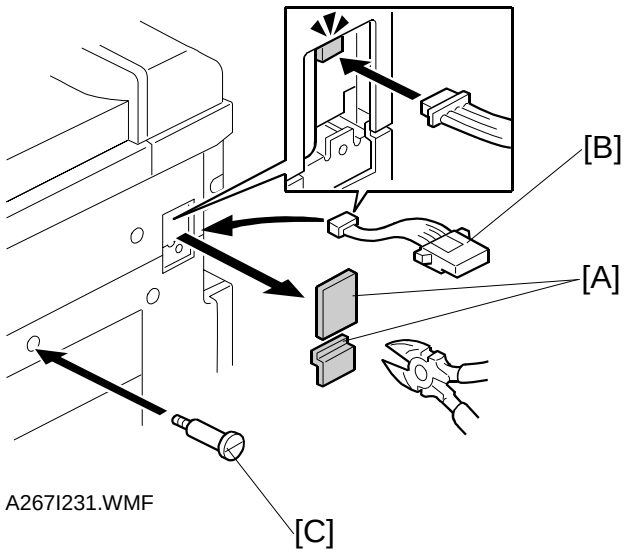
3.14 PLATEN COVER INSTALLATION



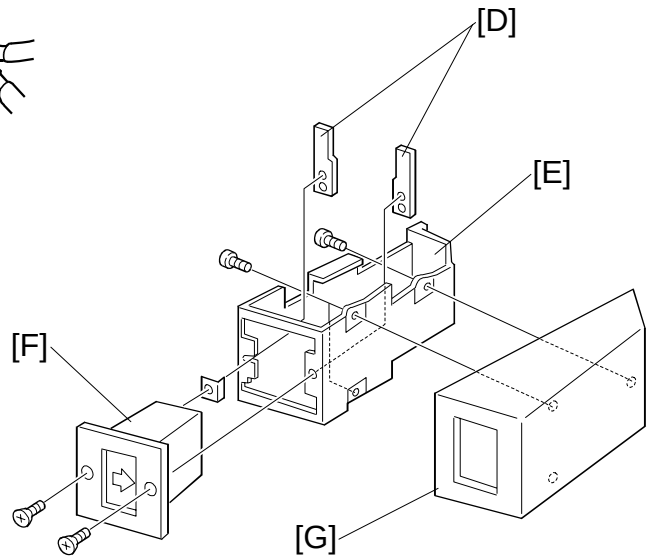
A267I505.WMF

1. Install the platen cover [A] (2 screws).

3.15 KEY COUNTER INSTALLATION



A267I231.WMF

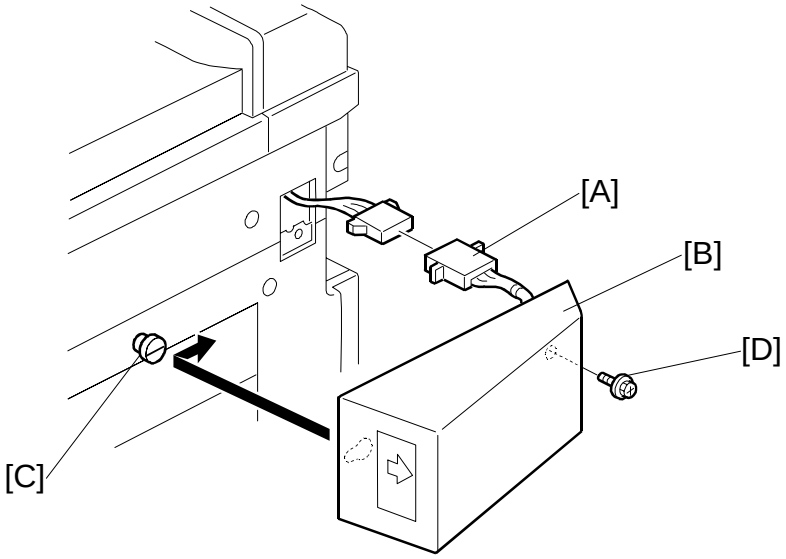


A265I500.WMF

⚠CAUTION

Unplug the machine power cord before starting the following procedure.

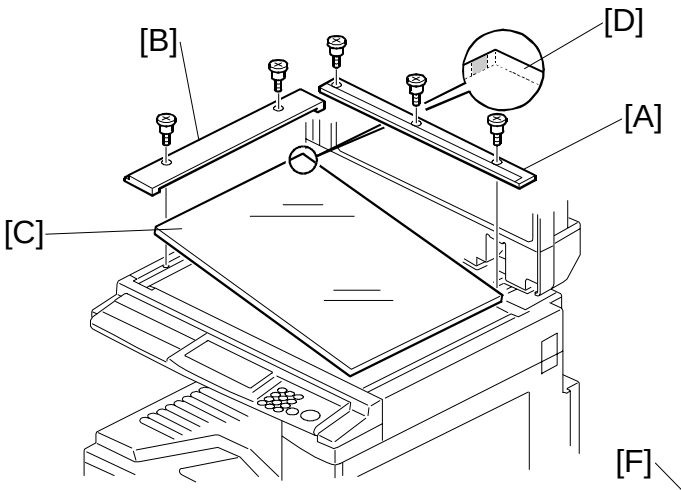
1. Remove two caps [A].
2. Connect the key counter cable [B].
3. Install the stepped screw [C].
4. Hold the key counter plate nuts [D] on the inside of the key counter bracket [E] and insert the key counter holder [F].
5. Secure the key counter holder to the bracket (2 screws).
6. Install the key counter cover [G] (2 screws).



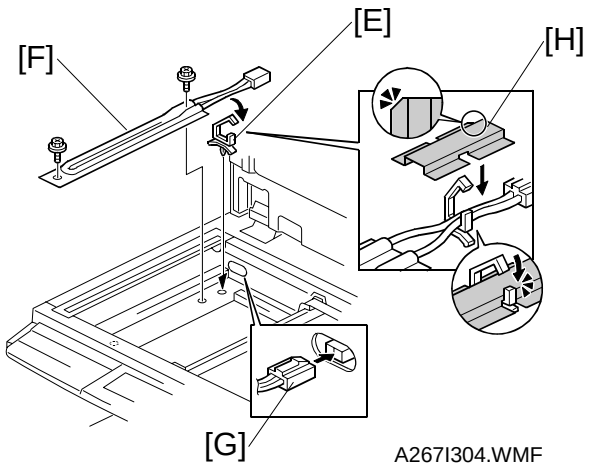
A267I232.WMF

7. Connect the cable [A].
8. Hook the key counter holder assembly [B] onto the stepped screw [C].
9. Secure the key counter holder assembly with a screw [D].
10. Change the value of SP5-113 to “1”.

3.16 ANTI-CONDENSATION HEATER



A267R001.WMF



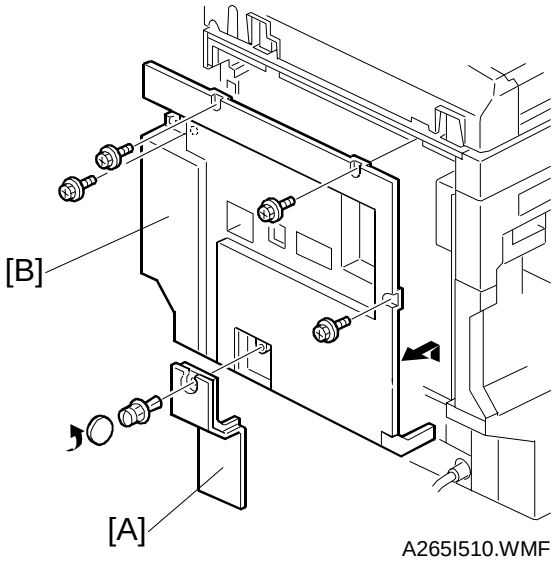
A267I304.WMF

⚠CAUTION

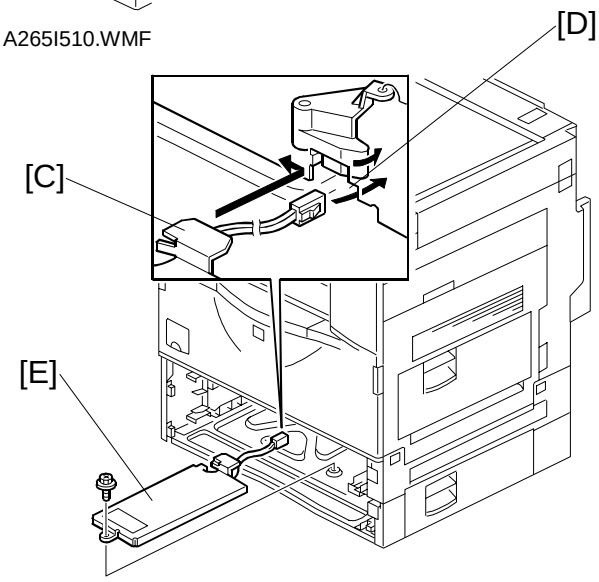
Unplug the machine power cord before starting the following procedure.

1. Remove the rear scale [A] (3 screws), left scale [B] (2 screws), and exposure glass [C].
   NOTE: When reinstalling the exposure glass, make sure that the mark [D] is positioned at the rear left corner, as shown.
2. Move the 1st and 2nd scanners to the right.
3. Install the cable clamp [E].
4. Install the anti-condensation heater [F] (2 screws).
5. Join the connectors [G]
6. Attach the cable cover [H], as shown.

3.17 TRAY HEATER



A265I510.WMF

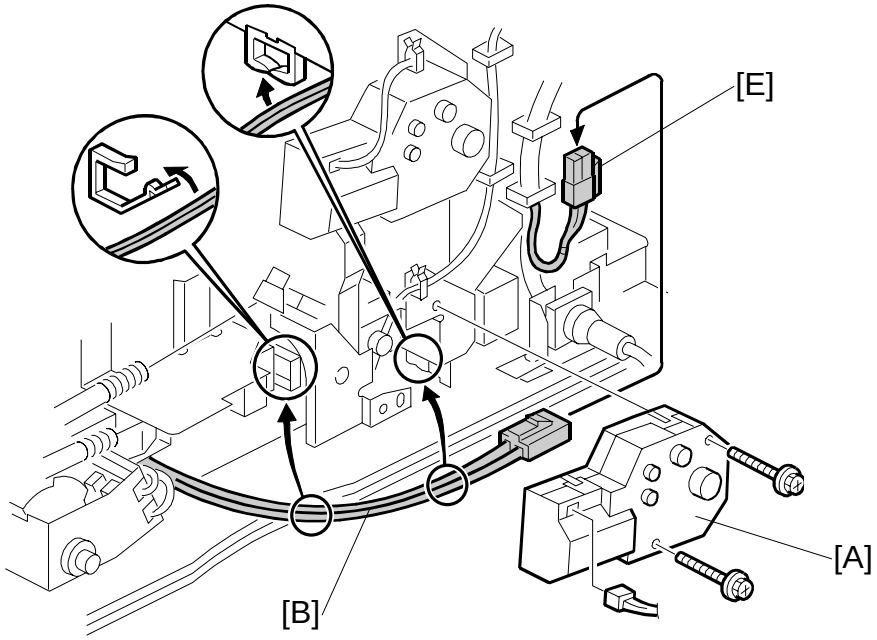


A265I502.WMF

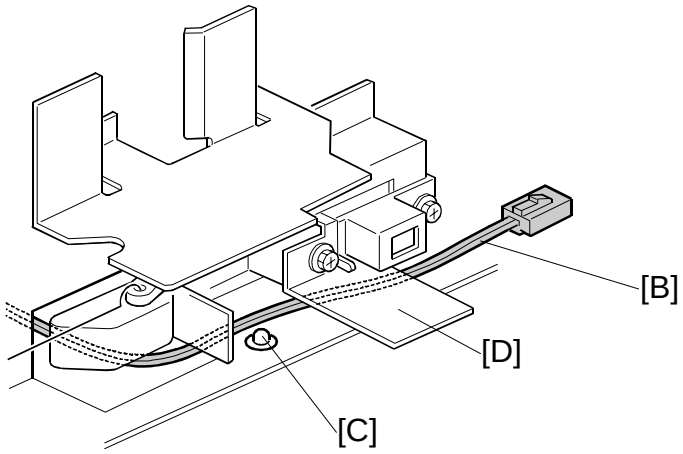
⚠CAUTION

Unplug the machine power cord before starting the following procedure.

1. Remove the connector cover [A] and rear cover [B] (4 screws).
2. Slide out the 1st and 2nd paper trays.
3. Pass the connector [C] through the opening [D].
4. Install the tray heater assembly [E] (1 screw).



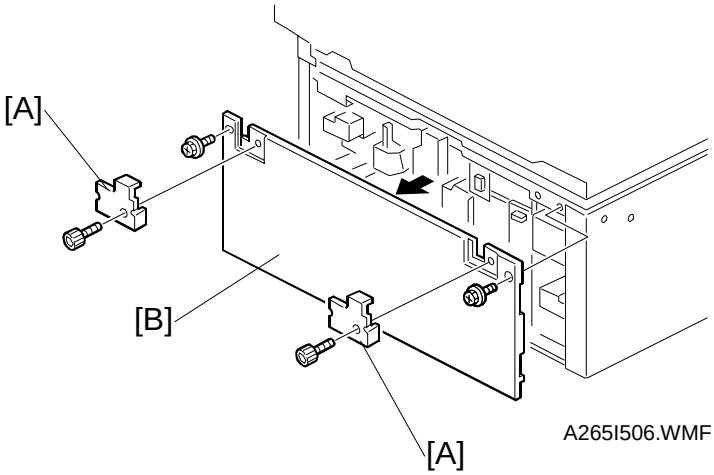
A265I501.WMF



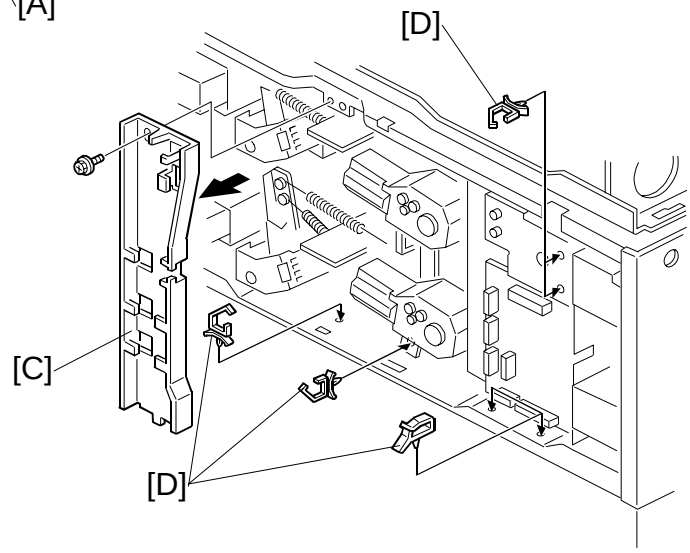
A265I513.WMF

5. Remove the 2nd paper lift motor [A] (2 screws, 1 connector).
6. Route the heater cable [B] to the side of rivet [C] and under bracket [D].
7. Clamp the heater cable [B] as shown.
8. Joint the heater cable and the ac cable [E].
9. Reinstall the paper lift motor [A] and reassemble the machine.

3.18 TRAY HEATER (OPTIONAL PAPER TRAY UNIT)



A265I506.WMF

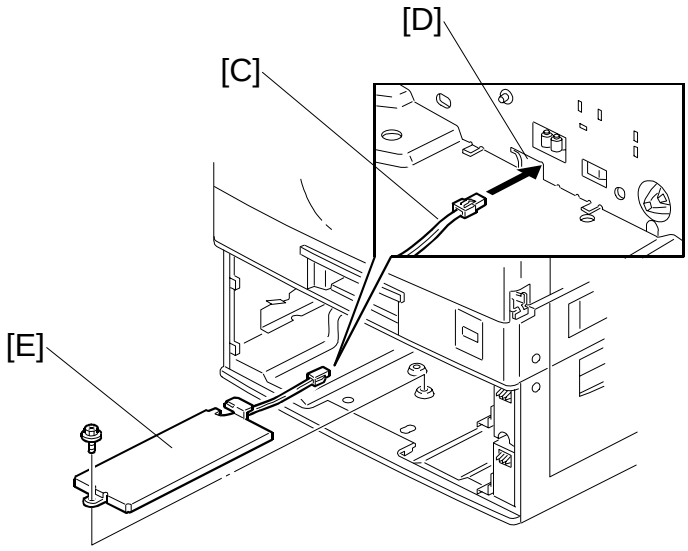


A265I509.WMF

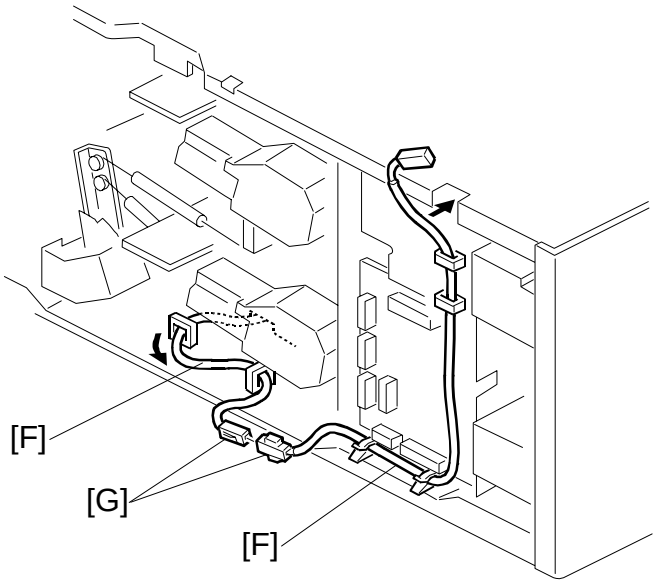
⚠CAUTION

Unplug the machine power cord before starting the following procedure.

1. Remove the joint brackets [A] (1 screw each).
2. Remove the rear cover [B] for the optional paper tray unit (2 screws).
3. Remove the cable guide [C] (1 screw).
4. Install the clamps [D].

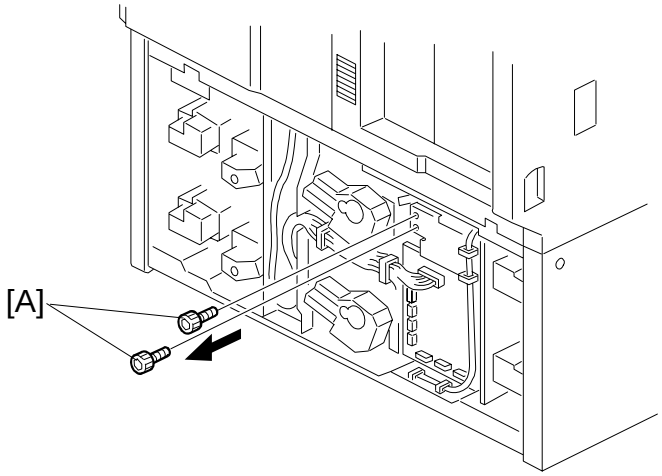


A265I503.WMF

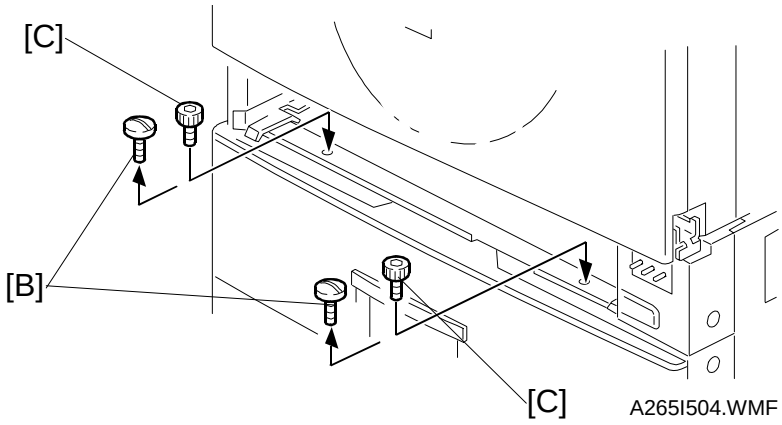


A265I505.WMF

5. Slide out the two paper trays from the optional paper tray unit.
6. Attach the tray heater [A] to the heater bracket [B], as shown.
7. Pass the connector [C] through the opening [D].
8. Install the tray heater assembly [E] (1 screw).
9. Clamp the cables [F], as shown.
10. Joint the connectors [G].
11. Reinstall the cable guide.



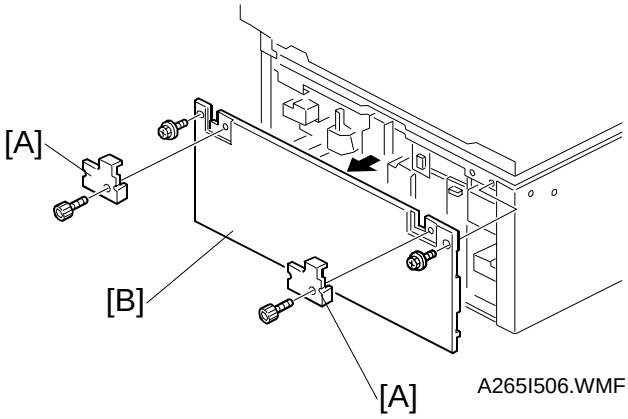
A265I508.WMF



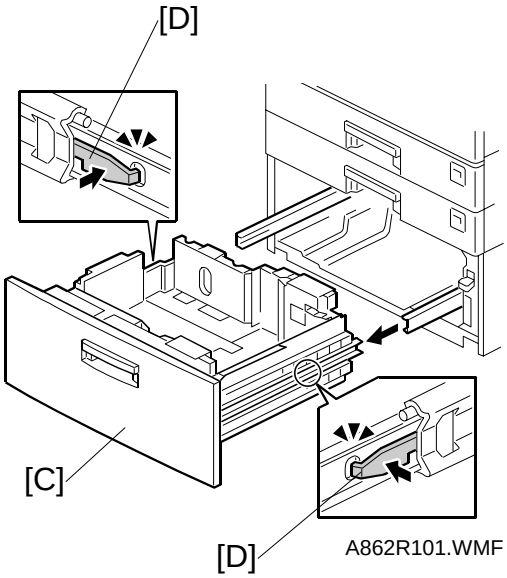
A265I504.WMF

12. Remove two screws [A] from the rear side of the paper feed unit.
13. Reinstall the rear cover for the optional paper tray unit.
14. Reinstall the two paper trays into the optional paper tray unit.
15. Remove the 2nd paper tray of the copier.
16. Remove two screws [B] and install the screws [C] which were removed in step 12.
17. Reinstall the 2nd paper tray of the copier.

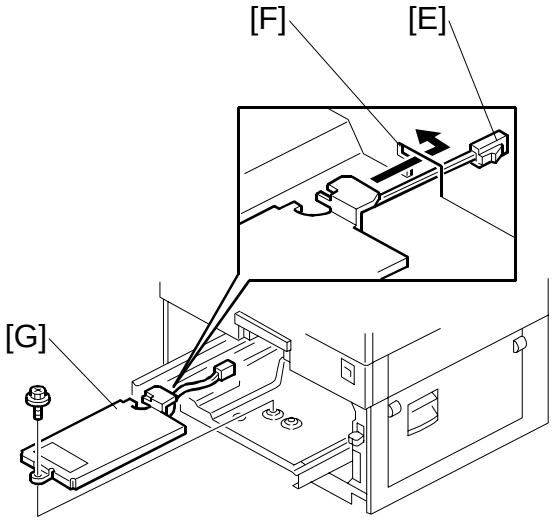
3.19 TRAY HEATER (OPTIONAL LCT)



A265I506.WMF



A862R101.WMF

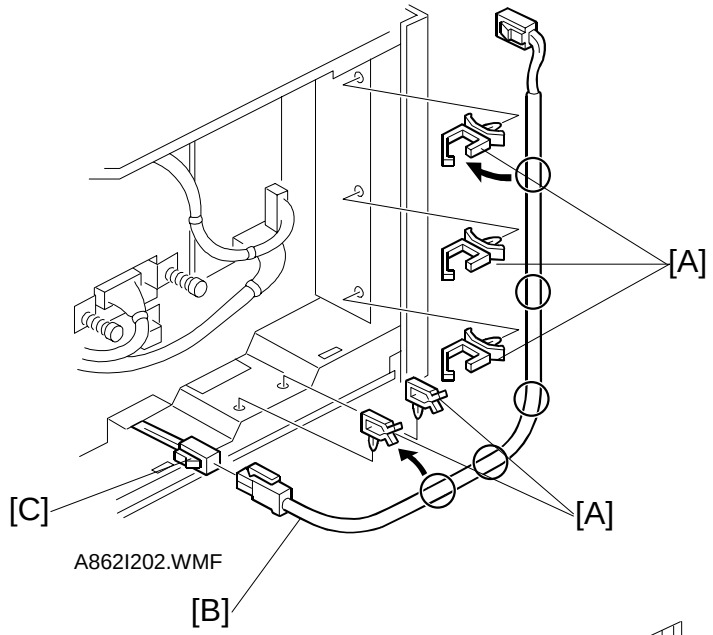


A265I507.WMF

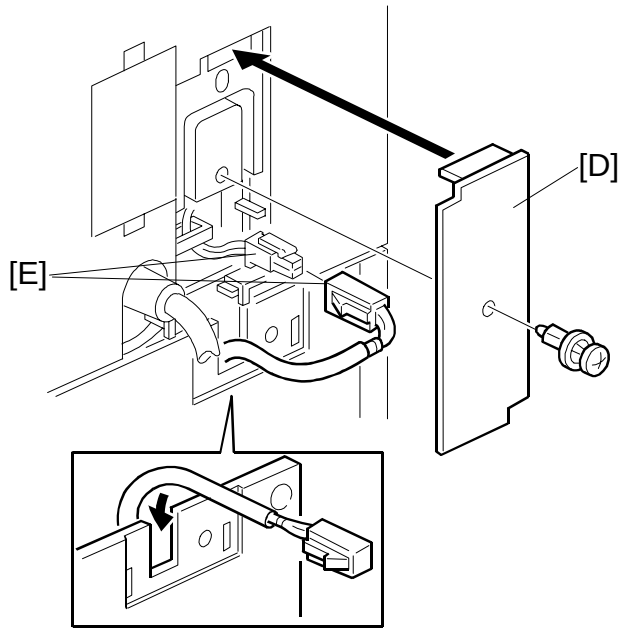
⚠CAUTION

Unplug the machine power cord before starting the following procedure.

1. Remove two joint brackets [A] (1 screw each).
2. Remove the rear cover for the LCT [B] (2 screws).
3. Slide out the paper tray [C].
4. Push the stopper [D] on both slide rails and remove the paper tray.
5. Pass the connector [E] through the opening [F].
6. Install the tray heater [G] (1 screw).

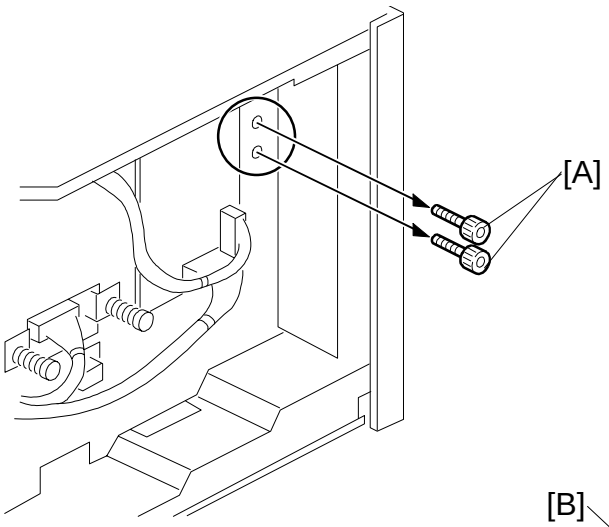


A862I202.WMF

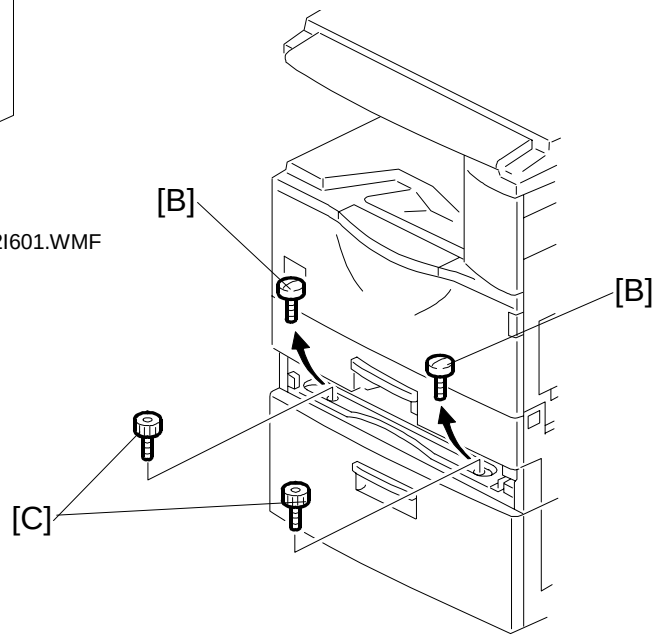


A860I203.WMF

7. Install five clamps [A].
8. Connect the cable [B] to the tray heater cable [C].
9. Route the cable and clamp it.
10. Remove the connector cover of the copier [D].
11. Join the connectors [E].
12. Reinstall the connector cover of the copier.



A862I601.WMF



A862I600.WMF

13. Remove two screws [A] from the rear side of the LCT.
14. Reinstall the rear cover of the LCT.
15. Reinstall the paper tray.
16. Remove the 2nd paper tray of the copier.
17. Remove two screws [B] and install the screws [C] which were removed in step 13.
18. Reinstall the 2nd paper tray of the copier.

4. SERVICE TABLES

4.1 GENERAL CAUTION

Do not turn off the main switch while any of the electrical components are active. Doing so might cause damage to units, such as the PCU, when they are pulled out of or put back into the copier.

4.1.1 PCU (PHOTOCONDUCTOR UNIT)

The PCU consists of the OPC drum, development unit, charge roller, and cleaning unit. Follow the cautions below when handling a PCU.

1. Never touch the drum surface with bare hands. When the drum surface is touched or becomes dirty, wipe it with a dry cloth or clean it with wet cotton. Wipe with a dry cloth after cleaning with the cotton.
2. Never used alcohol to clean the drum; alcohol dissolves the drum surface.
3. Store the PCU in a cool, dry place away from heat.
4. Never expose the drum to corrosive gases such as ammonia gas.
5. Never shake the used PCU. Doing so may cause toner and/or developer to spill out.
6. Dispose of used PCUs in accordance with local regulations.

4.1.2 TRANSFER ROLLER UNIT

1. Never touch the transfer roller surface with bare hands.
2. Take care not to scratch the transfer roller as the surface is easily damaged.

4.1.3 SCANNER UNIT

1. Clean the exposure glass with alcohol or with glass cleaner to reduce the amount of static electricity on the surface of the glass.
2. Use a blower brush or a cotton pad with water to clean the mirrors and lens.
3. Do not bend or crease the exposure lamp flat cable.
4. Do not disassemble the lens unit. Doing so will throw the lens and the copy image out of focus.
5. Do not turn any of the CCD positioning screws. Doing so will throw the CCD out of position.

4.1.4 LASER UNIT

1. Do not loosen the screws that secure the LD drive board to the laser diode casing. Doing so will throw the LD unit out of adjustment.
2. Do not adjust the variable resistors on the LD unit, as they are adjusted in the factory.
3. The polygon mirror and F-theta mirror are very sensitive to dust.
4. Do not touch the glass surface of the polygon mirror motor unit with bare hands.

4.1.5 FUSING UNIT

1. After installing the fusing thermistor, make sure that it is in contact with the hot roller and that the hot roller can rotate freely.
2. Be careful not to damage the edges of the hot roller strippers or their tension springs.
3. Do not touch the fusing lamp and rollers with bare hands.
4. Make sure that the fusing lamp is positioned correctly and that it does not touch the inner surface of the hot roller.

4.1.6 PAPER FEED

1. Do not touch the surface of the paper feed roller.
2. To avoid paper misfeeds, the side fences and end fences of the paper tray must be positioned correctly to align with the actual paper size.

4.1.7 OTHERS

1. The TD sensor initial setting is performed automatically after installing the new PCU and closing the front cover. Never open the front cover or turn off the main switch during this time. The main motor stops when the initial setting has finished.
2. The toner bottle should be replaced while the main switch is on.
3. If the optional tray, drum, and optics anti-condensation heaters have been installed, keep the copier power cord plugged in, even when the copier main switch is turned off. This keeps the heaters energized.

4.2 SERVICE PROGRAM MODE

4.2.1 SERVICE PROGRAM MODE OPERATION

The service program (SP) mode is used to check electrical data, change modes, and adjust values.

Service Program Access Procedure

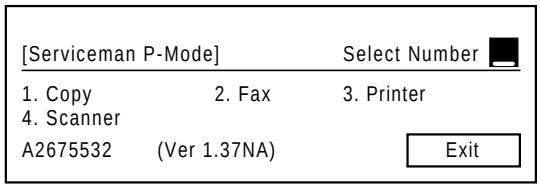
How to Enter the SP Mode

1) Press the following keys in sequence.

[Clear Modes] → 1 → 0 → 7 → C/⊘

- Hold the C/⊘ (Clear/Stop) key for more than 3 seconds.

2) A menu of SP modes is displayed on the LCD.

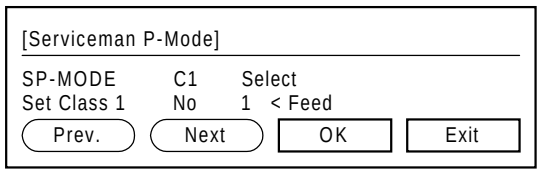


A265M502.WMF

NOTE: 1) The installed applications appear as 1. Copy, 2. Fax, 3. Printer, 4. Scanner. If an application is not installed, the application name does not appear.

2) The meaning of the bottom line is as follows.
   - "A267XXXX" is the part number of the BICU board software.
   - "(ver X. X. XX)" is the BICU board software version.

3) Press the number for the application which you need (e.g. press "1" for copier). Then, the application's SP mode display will appear, as shown.



A265M503.WMF

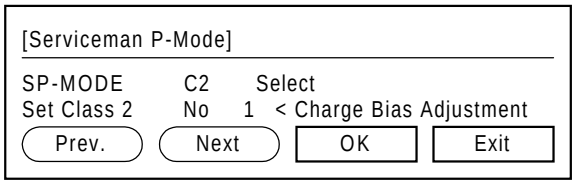
How to Exit SP Mode

Press the "Back" and "Exit" keys or [Clear Modes] key until the standby mode display appears.

Accessing Copy Mode from within an SP Mode

1. Press the (Interrupt) key.
2. Select the appropriate copy mode and make trial copies.
3. To return to SP mode, press the (Interrupt) key again.

How to Select the Program Number



A265M509.WMF

Program numbers are composed of two or three levels.

To input the required program number, select each program level in sequence.

1. Select the 1st level program number on the numeric keypad and press the # key or "OK" key.
   NOTE: The 1st level program number can be selected by pressing the "Prev." or "Next" bottom on the LCD.
2. Select the 2nd level program number at the numeric keypad and press the # key or "OK" key.
   NOTE: The 2nd level program number can be selected by pressing the "Prev." or "Next" bottom on the LCD.
3. If there any are 3rd level programs in SP mode, first enter the 2nd level SP mode, then pressing the "Prev." or "Next" bottom on the LCD.

To input a value or setting for an SP mode

1. Enter the required program mode as explained above.
2. Enter the required setting using the numeric keys, then press the # key or "OK" key.

NOTE: 1) If you forget to press the # key or "OK" key, the previous value remains.
2) Change between "+" and "–" using the key before entering the required value.

3. Exit SP mode.

4.2.2 SERVICE PROGRAM MODE TABLES

NOTE: 1) In the Function column, comments are in *italics*.
2) In the Setting column, the default value is in **bold** letters.
3) An asterisk "*" after the mode number means that this mode is stored in the NVRAM. If you do a RAM reset, all these SP modes will be return to their factory settings.
4) SP4-915 to 4-941: When the SP mode name has a prefix of "P-", the adjustment is only effective when the user selects an original type of "Service Mode" (User Tools - General Features - 09. Image Adjustment).

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-001*	1	Leading Edge Registration (Paper Tray Feed)	Adjusts the printing leading edge registration from each paper feed station using the Trimming Area Pattern (SP5-902, No.10). *Use the # key to toggle between + and - before entering the value. The specification is 3 ± 2 mm. See "Replacement and Adjustment - Copy Adjustment" for details.*	+9.0 ~ –9.0 0.1 mm/step **+0.0 mm**
	2	Leading Edge Registration (By-pass Feed)		+12.5~–12.5 0.1 mm/step **+0.0 mm**
	3	Leading Edge Registration (Duplex)		+12.5~–12.5 0.1 mm/step **+0.0 mm**
1-002*	1	Side-to-Side Registration (1st Paper Feed)	Adjusts the printing side-to-side registration from each paper feed station using the Trimming Area Pattern (SP5-902, No.10). *Use the # key to toggle between + and - before entering the value. The specification is 2 ± 1.5 mm. See "Replacement and Adjustment - Copy Adjustment" for details.*	+9.0 ~ –9.0 0.1 mm/step **+0.0 mm**
	2	Side-to-Side Registration (2nd Paper Feed)		
	3	Side-to-Side Registration (3rd Paper Feed: optional PFU tray 1 or optional LCT)		
	4	Side-to-Side Registration (4th Paper Feed: optional PFU tray 2)		
	5	Side-to-Side Registration (By-pass Feed)		
	6	Side-to-Side Registration (Duplex)		
1-003*	1	Paper Feed Timing (1st Paper Feed)	Adjusts the paper feed clutch timing at registration. The paper feed clutch timing determines the amount of paper buckle at registration. (A larger setting leads to more buckling.)	0 ~ 10 1 mm/step **5 mm**

Service Tables

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-003*	2	Paper Feed Timing (2nd, 3rd, 4th Paper Feed, LCT, and By-pass Feed)	Adjusts the paper feed clutch timing at registration. The paper feed clutch timing determines the amount of paper buckle at registration. (A larger setting leads to more buckling.)	0 ~ 10 1 mm/step **5 mm**
	3	Paper Feed Timing (Duplex)		0 ~ 20 1 mm/step **6 mm**
1-007		By-pass Paper Size Display	Displays the by-pass paper width sensor output.	
1-105*	1	Fusing Temperature Adjustment (Stand-by)	Adjusts the fusing temperature for standby mode.	155 ~ 190 1°C/step **170°C**
	2	Fusing Temperature Adjustment (Low Power Level 2)	Adjusts the fusing temperature for low power level 2. *With a lower value, the machine takes more time to reach the ready condition.*	0 ~ 80 1°C/step **80°C**
	3	Fusing Temperature Adjustment (Special Paper)	Adjusts the additional fusing temperature for the special paper mode selected by the lever on the 2nd paper tray; also for the bypass tray (all paper types).	0 ~ 20 1°C/step **10°C**
1-106		Fusing Temp. Display	Displays the fusing temperature. *Press the [Clear Modes] key to exit the display.*	
1-107*	1	Fusing Soft Start Adjustment (Stand-by, Energy saver)	Adjusts the number of zero-cross cycles of the fusing lamp ac supply needed for the fusing lamp power to reach 100%. Use a higher number if the customer complains about sudden power dropouts. **For European models, this SP mode is effective in the stand-by mode and energy saver mode only.** *See "Detailed Descriptions - Fusing Unit" for details on SP1-107.*	N. America **0: 3 times** 1: 10 times 2: 20 times Europe/Asia 0: 5 times **1: 10 times** 2: 20 times
	2	Fusing Soft Start Adjustment (Printing)	**For European models only.** Adjusts the number of zero-cross cycles of the fusing lamp ac supply needed for the fusing lamp power to reach 100% when raising the temperature during printing. Use a higher number if the customer complains about sudden power dropouts. *See "Detailed Descriptions - Fusing Unit" for details on SP1-107.*	0: 5 times **1: 10 times** 2: 20 times
1-108*	1	Fusing Soft Start Setting (Stand-by, Energy saver)	Selects whether the fusing temperature control cycle is 1 or 3 seconds. **For European models, this SP mode is effective in the stand-by mode and energy saver mode only.** *If this is "1", the power supply fluctuates less when the fusing lamp turns on. See "Detailed Descriptions - Fusing Unit" for details.*	**0: 1 sec** 1: 3 sec

<table>
<tr><th colspan="3">Mode No.</th><th rowspan="2">Function</th><th rowspan="2">Settings</th></tr>
<tr><th>Class 1 and 2</th><th>Class 3</th><th></th></tr>
<tr><td rowspan="2">1-108*</td><td rowspan="2">2</td><td rowspan="2">Fusing Soft Start Setting (Printing)</td><td>For European models only.
Selects whether the fusing temperature control cycle is 0.5 or 1 seconds during printing.</td><td rowspan="2">0: 500 ms
1: 1 sec</td></tr>
<tr><td>If this is “1”, the power supply fluctuates less when the fusing lamp turns on. See “Detailed Descriptions - Fusing Unit” for details.</td></tr>
<tr><td rowspan="2">1-109</td><td rowspan="2"></td><td rowspan="2">Fusing Nip Band Check</td><td>Checks the fusing nip band</td><td rowspan="2">1: Start
0: Stop</td></tr>
<tr><td>Refer to “Nip Band Width Measurement” for more details.</td></tr>
<tr><td rowspan="2">1-901*</td><td rowspan="2"></td><td rowspan="2">Auto Re-start Interval</td><td>Adjusts the auto re-start time.</td><td rowspan="2">0 ~ 9999
1 s/step
0 s</td></tr>
<tr><td>Do not change the value.</td></tr>
<tr><td rowspan="2">1-902</td><td rowspan="2"></td><td rowspan="2">AC Frequency Display</td><td>Displays the fusing lamp power control frequency which is detected by the zero cross signal generator.</td><td rowspan="2"></td></tr>
<tr><td>Under “54” equals 50 Hz. Otherwise, 60 Hz.</td></tr>
<tr><td rowspan="3">1-903*</td><td>1</td><td>Feed Clutch Re-energize (By-pass Feed)</td><td rowspan="2">Adjusts the paper feed amount allowed by the clutch (see the table below) after correcting the skew at registration.
<table><tr><th>Paper Feed Station</th><th>Clutch</th></tr><tr><td>By-pass Feed</td><td>Upper Relay</td></tr><tr><td>1st Paper Tray</td><td>1st Paper Feed</td></tr><tr><td>Other Paper Trays</td><td>Upper Relay</td></tr></table>When paper jams occur after restarting paper feed after registration, increase the value to help the registration roller feed the paper.</td><td rowspan="3">0 ~ 10
1 mm/step

Defaults
By-pass: 6
1st tray: 0
Other: 0</td></tr>
<tr><td>2</td><td>Feed Clutch Re-energize (1st Paper Tray)</td></tr>
<tr><td>3</td><td>Feed Clutch Re-energize (Other Paper Trays)</td></tr>
<tr><td>1-905*</td><td></td><td>Tray Paper Full Detection</td><td>Determines whether or not to detect if the built-in copy tray is full.</td><td>0: No
1: Yes</td></tr>
<tr><td rowspan="2">1-906*</td><td rowspan="2"></td><td rowspan="2">Tray Paper Full Timer</td><td>Adjusts the time that the paper overflow sensor must remain on before a message appears on the LCD. The sensor may be switched on and off again if the paper is curled, giving a false tray full detection. This SP prevents this problem.</td><td rowspan="2">100 ~ 5000
10 ms/step
500</td></tr>
<tr><td>This SP mode is used when SP1-905 is set to 1.</td></tr>
</table>

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-908*	1	1st Bottom Plate Pressure Adjustment (Normal Size)	If a middle size threshold is not stored with SP1-908-9, this SP adjusts the upper paper lift motor reverse time for paper sizes larger than the small size threshold set with SP1-908-8. If a middle size threshold is stored with SP1-908-9, then this SP adjusts the motor reverse time for sizes larger than the middle size. **Do not input a value greater than 1200.** *Use this SP when a paper feed problem occurs from the 1st paper tray.* *See "Paper Lift Mechanism" for details on SP1-908.*	0 ~ 2000 1 ms/step **200 ms**
	2	1st Bottom Plate Pressure Adjustment (Small Size)	Adjusts the upper paper lift motor reverse time for paper of the same size as or smaller than the small size threshold set with SP1-908-8. **Do not input a value greater than 1200.** *Use this SP when a paper feed problem occurs from the 1st paper tray.* *See "Paper Lift Mechanism" for details on SP1-908.*	0 ~ 2000 1 ms/step **600 ms**
	3	1st Bottom Plate Pressure Adjustment (Middle Size)	Adjusts the upper paper lift motor reverse time for paper sizes larger than the small size threshold set with SP1-908-8, up to and including the middle size threshold set with SP1-908-9. If a middle size threshold is not stored with SP1-908-9, this SP is not used. **Do not input a value greater than 1200.** *Use this SP when a paper feed problem occurs from the 1st paper tray.* *See "Paper Lift Mechanism" for details on SP1-908.*	0 ~ 2000 1 ms/step **200 ms**
	4	1st Bottom Plate Pressure Re-adjustment (Small Size)	Adjusts the upper paper lift motor forward rotation time for paper of the same size as or smaller than the small size threshold set with SP1-908-8. The motor rotates forward when the remaining paper amount is lower than the value of SP1-908-6. *Use this SP when a paper feed problem occurs when paper in the 1st paper tray is running low.* *See "Paper Lift Mechanism" for details on SP1-908.*	0 ~ 2000 1 ms/step **400 ms**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-908*	5	1st Bottom Plate Pressure Re-adjustment (Middle Size)	Adjusts the upper paper lift motor forward rotation time for paper sizes larger than the small size threshold set with SP1-908-8, up to and including the middle size threshold set with SP1-908-9. The motor rotates forward when the amount of remaining paper is lower than the value of SP1-908-7. If a middle size threshold is not stored with SP1-908-9, this SP is not used. *Use this SP when a paper feed problem occurs when paper in the 1st paper tray is running low.* *See "Paper Lift Mechanism" for details on SP1-908.*	0 ~ 2000 1 ms/step **300 ms**
	6	1st Paper Amount (Small Size)	Selects the remaining paper amount limit for use with SP1-908-4. *Set this SP to 2 or 3 when a paper feed problem occurs before near-end.* *See "Paper Lift Mechanism" for details on SP1-908.*	0: None (Empty) **1: Near End** 2: 25% 3: 75%
	7	1st Paper Amount (Middle Size)	Selects the remaining paper amount limit for use with SP1-908-5. *Set this SP to 2 or 3 when a paper feed problem occurs before near-end.* *See "Paper Lift Mechanism" for details on SP1-908.*	0: None (Empty) **1: Near End** 2: 25% 3: 75%
	8	1st Small Paper Size Setting	Selects the small size threshold for the 1st paper tray tray. "0" means that this setting is not used. *The size used by SP1-908 is determined by paper width. See "Paper Lift Mechanism" for details on SP1-908.*	0: None (Not used) **1: HLT/A5** 2: A4 3: LT 4: DLT 5: A3
	9	1st Middle Paper Size Setting	Selects the middle size threshold for the upper tray. "0" means that this setting is not used. *The value must be larger than the small size threshold (SP1-908-8). The size used by SP1-908 is determined by paper width. See "Paper Lift Mechanism" for details on SP1-908.*	**0: None (Not used)** 1: HLT/A5 2: A4 3: LT 4: DLT 5: A3

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-909*	1	2nd Bottom Plate Pressure Adjustment (Normal Size)	If a middle size threshold is not stored with SP1-909-9, this SP adjusts the upper paper lift motor reverse time for paper sizes larger than the small size threshold set with SP1-909-8. If a middle size threshold is stored with SP1-909-9, then this SP adjusts the motor reverse time for sizes larger than the middle size. **Do not input a value greater than 1200.** *Use this SP when a paper feed problem occurs from the 2nd paper tray.* *See "Paper Lift Mechanism" for details on SP1-909.*	0 ~ 2000 1 ms/step **200 ms**
	2	2nd Bottom Plate Pressure Adjustment (Small Size)	Adjusts the upper paper lift motor reverse time for paper of the same size as or smaller than the small size threshold set with SP1-909-8. **Do not input a value greater than 1200.** *Use this SP when a paper feed problem occurs from the 2nd paper tray.* *See "Paper Lift Mechanism" for details on SP1-909.*	0 ~ 2000 1 ms/step **600 ms**
	3	2nd Bottom Plate Pressure Adjustment (Middle Size)	Adjusts the upper paper lift motor reverse time for paper sizes larger than the small size threshold set with SP1-909-8, up to and including the middle size threshold set with SP1-909-9. If a middle size threshold is not stored with SP1-909-9, this SP is not used. **Do not input a value greater than 1200.** *Use this SP when a paper feed problem occurs from the 2nd paper tray.* *See "Paper Lift Mechanism" for details on SP1-909.*	0 ~ 2000 1 ms/step **200 ms**
	4	2nd Bottom Plate Pressure Re-adjustment (Small Size)	Adjusts the upper paper lift motor forward rotation time for paper of the same size as or smaller than the small size threshold set with SP1-909-8. The motor rotates forward when the remaining paper amount is lower than the value of SP1-909-6. *Use this SP when a paper feed problem occurs when paper in the 2nd paper tray is running low.* *See "Paper Lift Mechanism" for details on SP1-909.*	0 ~ 2000 1 ms/step **400 ms**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-909*	5	2nd Bottom Plate Pressure Re-adjustment (Middle Size)	Adjusts the upper paper lift motor forward rotation time for paper sizes larger than the small size threshold set with SP1-909-8, up to and including the middle size threshold set with SP1-909-9. The motor rotates forward when the remaining paper amount is lower than the value of SP1-909-7. If a middle size threshold is not stored with SP1-909-9, this SP is not used. *Use this SP when a paper feed problem occurs when paper in the 2nd paper tray is running low.* *See "Paper Lift Mechanism" for details on SP1-909.*	0 ~ 2000 1 ms/step **300 ms**
	6	2nd Paper Amount (Small Size)	Selects the remaining paper amount limit for use with SP1-909-4. *Set this SP to 2 or 3 when a paper feed problem occurs before near-end.* *See "Paper Lift Mechanism" for details on SP1-909.*	0: None (Empty) **1: Near End** 2: 25% 3: 75%
	7	2nd Paper Amount (Middle Size)	Selects the remaining paper amount limit for use with SP1-909-5. *Set this SP to 2 or 3 when a paper feed problem occurs before near-end.* *See "Paper Lift Mechanism" for details on SP1-909.*	0: None (Empty) **1: Near End** 2: 25% 3: 75%
	8	2nd Small Paper Size Setting	Selects the small size threshold for the 2nd paper tray. "0" means that this setting is not used. *The size used by SP1-909 is determined by paper width. See "Paper Lift Mechanism" for details on SP1-909.*	0: None (Not used) **1: HLT/A5** 2: A4 3: LT 4: DLT 5: A3
	9	2nd Middle Paper Size Setting	Selects the middle size threshold for the upper tray. "0" means that this setting is not used. *The value must be larger than the small size threshold (SP1-909-8). The size used by SP1-909 is determined by paper width. See "Paper Lift Mechanism" for details on SP1-909.*	**0: None (Not used)** 1: HLT/A5 2: A4 3: LT 4: DLT 5: A3

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-910*	1	3rd Bottom Plate Pressure Adjustment (Normal Size) (Optional PFU)	If a middle size threshold is not stored with SP1-910-9, this SP adjusts the upper paper lift motor reverse time for paper sizes larger than the small size threshold set with SP1-910-8. If a middle size threshold is stored with SP1-910-9, then this SP adjusts the motor reverse time for sizes larger than the middle size. **Do not input a value greater than 1200.** *Use this SP when a paper feed problem occurs from the 3rd paper tray.* *See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-910.*	0 ~ 2000 1 ms/step **200 ms**
	2	3rd Bottom Plate Pressure Adjustment (Small Size) (Optional PFU)	Adjusts the upper paper lift motor reverse time for paper of the same size as or smaller than the small size threshold set with SP1-910-8. **Do not input a value greater than 1200.** *Use this SP when a paper feed problem occurs from the 3rd paper tray.* *See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-910.*	0 ~ 2000 1 ms/step **600 ms**
	3	3rd Bottom Plate Pressure Adjustment (Middle Size) (Optional PFU)	Adjusts the upper paper lift motor reverse time for paper sizes larger than the small size threshold set with SP1-910-8, up to and including the middle size threshold set with SP1-910-9. If a middle size threshold is not stored with SP1-910-9, this SP is not used. **Do not input a value greater than 1200.** *Use this SP when a paper feed problem occurs from the 3rd paper tray.* *See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-910.*	0 ~ 2000 1 ms/step **200 ms**
	4	3rd Bottom Plate Pressure Re-adjustment (Small Size) (Optional PFU)	Adjusts the upper paper lift motor forward rotation time for paper of the same size as or smaller than the small size threshold set with SP1-910-8. The motor rotates forward when the remaining paper amount is lower than the value of SP1-910-6. *Use this SP when a paper feed problem occurs when paper in the 3rd paper tray is running low.* *See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-910.*	0 ~ 2000 1 ms/step **400 ms**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-910*	5	3rd Bottom Plate Pressure Re-adjustment (Middle Size) (Optional PFU)	Adjusts the upper paper lift motor forward rotation time for paper sizes larger than the small size threshold set with SP1-910-8, up to and including the middle size threshold set with SP1-910-9. The motor rotates forward when the remaining paper is lower than the value of SP1-910-7. If a middle size threshold is not stored with SP1-910-9, this SP is not used. *Use this SP when a paper feed problem occurs when paper in the 3rd paper tray is running low.* *See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-910.*	0 ~ 2000 1 ms/step **300 ms**
	6	3rd Paper Amount (Small Size) (Optional PFU)	Selects the remaining paper amount limit for use with SP1-910-4. *Set this SP to 2 or 3 when a paper feed problem occurs before near-end.* *See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-910.*	0: None (Empty) **1: Near End** 2: 25% 3: 75%
	7	3rd Paper Amount (Middle Size) (Optional PFU)	Selects the remaining paper amount limit for use with SP1-910-5. *Set this SP to 2 or 3 when a paper feed problem occurs before near-end.* *See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-910.*	0: None (Empty) **1: Near End** 2: 25% 3: 75%
	8	3rd Small Paper Size Setting (Optional PFU)	Selects the small size threshold for the 3rd paper tray. "0" means that this setting is not used. *The size used by SP1-910 is determined by paper width. See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-910.*	0: None (Not used) **1: HLT/A5** 2: A4 3: LT 4: DLT 5: A3
	9	3rd Middle Paper Size Setting (Optional PFU)	Selects the middle size threshold for the upper tray. "0" means that this setting is not used. *The value must be larger than the small size threshold (SP1-910-8). The size used by SP1-910 is determined by paper width. See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-910.*	**0: None (Not used)** 1: HLT/A5 2: A4 3: LT 4: DLT 5: A3

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-911*	1	4th Bottom Plate Pressure Adjustment (Normal Size) (Optional PFU)	If a middle size threshold is not stored with SP1-911-9, this SP adjusts the upper paper lift motor reverse time for paper sizes larger than the small size threshold set with SP1-911-8. If a middle size threshold is stored with SP1-911-9, then this SP adjusts the motor reverse time for sizes larger than the middle size. **Do not input a value greater than 1200.** *Use this SP when a paper feed problem occurs from the 4th paper tray.* *See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-911.*	0 ~ 2000 1 ms/step **200 ms**
	2	4th Bottom Plate Pressure Adjustment (Small Size) (Optional PFU)	Adjusts the upper paper lift motor reverse time for paper of the same size as or smaller than the small size threshold set with SP1-911-8. **Do not input a value greater than 1200.** *Use this SP when a paper feed problem occurs from the 4th paper tray.* *See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-911.*	0 ~ 2000 1 ms/step **600 ms**
	3	4th Bottom Plate Pressure Adjustment (Middle Size) (Optional PFU)	Adjusts the upper paper lift motor reverse time for paper sizes larger than the small size threshold set with SP1-911-8, up to and including the middle size threshold set with SP1-911-9. If a middle size threshold is not stored with SP1-911-9, this SP is not used. **Do not input a value greater than 1200.** *Use this SP when a paper feed problem occurs from the 4th paper tray.* *See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-911.*	0 ~ 2000 1 ms/step **200 ms**
	4	4th Bottom Plate Pressure Re-adjustment (Small Size) (Optional PFU)	Adjusts the upper paper lift motor forward rotation time for paper of the same size as or smaller than the small size threshold set with SP1-911-8. The motor rotates forward when the remaining paper amount is lower than the value of SP1-911-6. *Use this SP when a paper feed problem occurs when paper in the 4th paper tray is running low.* *See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-911.*	0 ~ 2000 1 ms/step **400 ms**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-911*	5	4th Bottom Plate Pressure Re-adjustment (Middle Size) (Optional PFU)	Adjusts the upper paper lift motor forward rotation time for paper sizes larger than the small size threshold set with SP1-911-8, up to and including the middle size threshold set with SP1-911-9. The motor rotates forward when the remaining paper amount is lower than the value of SP1-911-7. If a middle size threshold is not stored with SP1-911-9, this SP is not used. *Use this SP when a paper feed problem occurs when paper in the 4th paper tray is running low.* *See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-911.*	0 ~ 2000 1 ms/step **300 ms**
	6	4th Paper Amount (Small Size) (Optional PFU)	Selects the remaining paper amount limit for use with SP1-911-4. *Set this SP to 2 or 3 when a paper feed problem occurs before near-end.* *See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-911.*	0: None (Empty) **1: Near End** 2: 25% 3: 75%
	7	4th Paper Amount (Middle Size) (Optional PFU)	Selects the remaining paper amount limit for use with SP1-911-5. *Set this SP to 2 or 3 when a paper feed problem occurs before near-end.* *See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-911.*	0: None (Empty) **1: Near End** 2: 25% 3: 75%
	8	4th Small Paper Size Setting (Optional PFU)	Selects the small size threshold for the 4th paper tray. "0" means that this setting is not used. *The size used by SP1-911 is determined by paper width. See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-911.*	0: None (Not used) **1: HLT/A5** 2: A4 3: LT 4: DLT 5: A3
	9	4th Middle Paper Size Setting (Optional PFU)	Selects the middle size threshold for the upper tray. "0" means that this setting is not used. *The value must be larger than the small size threshold (SP1-911-8). The size used by SP1-911 is determined by paper width. See "Optional Paper Tray Unit - Paper Lift Mechanism" for details on SP1-911.*	**0: None (Not used)** 1: HLT/A5 2: A4 3: LT 4: DLT 5: A3
1-912*		Tray Motor Reverse Time	Adjusts the tray motor reverse time. *The tray motor reverses when the tray is pulled out. The tray can be put back in the machine without damage while the motor reverses.*	0 ~ 9000 1 ms/step **1700 ms**
1-920*	1	Duplex Inverter Motor Speed Adjustment (Forward/Low)	Adjusts the duplex inverter motor speed during forward rotation at low speed. *Use this SP when paper often jams at the duplex entrance area. Do not use in the field unless directed by service centre staff.*	-4 ~ 4 1/step **0**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
1-920*	2	Duplex Inverter Motor Speed Adjustment (Forward/High)	Adjusts the duplex inverter motor speed during forward rotation at high speed. *Use this SP when paper often jams at the duplex entrance area. Do not use in the field unless directed by service centre staff.*	-4 ~ 4 1/step **0**
	3	Duplex Inverter Motor Speed Adjustment (Reverse/Low)	Adjusts the duplex inverter motor speed during forward rotation at low speed. *Use this SP when paper often jams at the duplex inverter area. Do not use in the field unless directed by service centre staff.*	-4 ~ 4 1/step **0**
	4	Duplex Inverter Motor Speed Adjustment (Reverse/High)	Adjusts the duplex inverter motor speed during forward rotation at high speed. *Use this SP when paper often jams at the duplex inverter area. Do not use in the field unless directed by service centre staff.*	-4 ~ 4 1/step **0**
1-921	1	Duplex Transport Motor Speed Adjustment (Forward/Low)	Adjusts the duplex transport motor speed during forward rotation at low speed. *Use this SP when paper often jams at the duplex entrance area when feeding paper from the duplex unit to the registration area. Do not use in the field unless directed by service centre staff.*	-4 ~ 4 1/step **0**
	2	Duplex Transport Motor Speed Adjustment (Forward/High)	Adjusts the duplex transport motor speed during forward rotation at high speed. *Use this SP when paper often jams at the duplex entrance area when feeding paper from the duplex unit to the registration area. Do not use in the field unless directed by service centre staff.*	-4 ~ 4 1/step **0**
1-990*		Fusing Idling	Selects whether fusing idling is done or not when the machine returns to stand-by mode from low power mode level 2. *If this is at "1" and the fusing temperature in low power mode level 2 is 70°C ~ 90°C, fusing idling is done. See "Fusing Temperature Control" for more details.*	**0: No** 1: Yes
2-001*	1*	Charge Roller Bias Adjustment (Printing)	Adjusts the voltage applied to the charge roller during printing. *This value will be changed automatically when the charge roller bias correction is performed.* *Note that if this value is changed, the charge roller voltage will be corrected based on the new voltage.*	-2100 ~ –1500 1 V/step **–1650 V**
	2*	Charge Roller Bias Adjustment (ID sensor pattern)	Adjusts the voltage applied to the charge roller when making the Vsdp ID sensor pattern (for charge roller bias correction). *The actual charge roller voltage is this value plus the value of SP2-001-1.*	0 ~ 400 1 V/step **200**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-001*	3	Charge Roller Bias Adjustment (Temporally input)	Inputs the charge roller voltage temporarily for test purposes. ***Do not change the value.***	0 ~ -2500 1 V/step **0**
2-005*	1	Charge Roller Bias Correction (Vsdp Minimum)	Adjusts the lower threshold value for the charge roller correction. *When the value of Vsdp/Vsg is less than this value, the charge roller voltage increases by 50V (e.g. from –500 to –550). The size of the increase depends on SP 2-005-3.*	0 ~ 100 1%/step **90%**
2-005*	2	Charge Roller Bias Correction (Vsdp Maximum)	Adjusts the upper threshold value for the charge roller correction. *When the value of Vsdp/Vsg is greater than this value, the charge roller voltage decreases by 50V (e.g. from –550 to –500). The size of the decrease depends on SP 2-005-3.*	0 ~ 100 1%/step **95%**
	3	Charge Roller Bias Correction Step	Adjusts the size of the charge roller voltage correction.	0 ~ 200 1 V/step **50 V**
2-101*	1	Erase Margin Adjustment (Leading Edge)	Adjusts the leading edge erase margin. *The specification is 3 ± 2 mm. See "Replacement and Adjustment - Copy Adjustment" for details.*	0.0 ~ 9.0 0.1 mm/step **3.0 mm**
	2	Erase Margin Adjustment (Trailing Edge – Small Paper Size)	Adjusts the trailing edge erase margin for paper of length 216 mm or less. *The specification is 3 ± 2 mm. See "Replacement and Adjustment - Copy Adjustment" for details.*	0.0 ~ 9.0 0.1 mm/step **2.0 mm**
	3	Erase Margin Adjustment (Trailing Edge – Middle Paper Size)	Adjusts the trailing edge erase margin for paper of length 216.1 ~ 297 mm. *The specification is 3 ± 2 mm. See "Replacement and Adjustment - Copy Adjustment" for details.*	0.0 ~ 9.0 0.1 mm/step **3.0 mm**
	4	Erase Margin Adjustment (Trailing Edge – Large Paper Size)	Adjusts the trailing edge erase margin for paper longer than 297 mm. *The specification is 3 ± 2 mm. See "Replacement and Adjustment - Copy Adjustment" for details.*	0.0 ~ 9.0 0.1 mm/step **4.0 mm**
	5	Erase Margin Adjustment (Left Side)	Adjusts the left edge erase margin. *The specification is 2 ± 1.5 mm. See "Replacement and Adjustment - Copy Adjustment" for details.*	0.0 ~ 9.0 0.1 mm/step **2.0 mm**
	6	Erase Margin Adjustment (Right Side)	Adjusts the right edge erase margin. *The specification is 2 + 2.5/-1.5 mm. See "Replacement and Adjustment - Copy Adjustment" for details.*	0.0 ~ 9.0 0.1 mm/step **2.0 mm**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-101*	7	Erase Margin Adjustment (Rear – Trailing Edge)	Adjusts the trailing edge erase margin on the reverse side of duplex copies. The actual trailing edge erase margin on the reverse side is this value plus the value of SP2-101-2 or 3 or 4. *The specification is 3 ± 2 mm. See "Replacement and Adjustment - Copy Adjustment" for details*	0.0 ~ 9.0 0.1 mm/step **1.2 mm**
	8	Erase Margin Adjustment (Rear – Left Side)	Adjusts the left side erase margin on the reverse side of duplex copies. The actual left side erase margin on the reverse side is this value plus the value of SP2-101-5. *The specification is 2 ± 1.5 mm. See "Replacement and Adjustment - Copy Adjustment" for details.*	0.0 ~ 9.0 0.1 mm/step **0.3 mm**
	9	Erase Margin Adjustment (Rear – Right Side)	Adjusts the right side erase margin on the reverse side of duplex copies. The actual right side erase margin on the reverse side is this value plus the value of SP2-101-6 *The specification is 2 +2.5/-1.5 mm. See "Replacement and Adjustment - Copy Adjustment" for details.*	0.0 ~ 9.0 0.1 mm/step **0.3 mm**
	10	Erase Margin Adjustment (Printer, Rear Trailing Edge)	In printer mode, adjusts the trailing edge erase margin on the reverse side of duplex copies. The actual trailing edge erase margin on the reverse side is this value plus the value of SP2-101-7. *The specification is 3 ± 2 mm. See "Replacement and Adjustment - Copy Adjustment" for details.*	0.0 ~ 9.0 0.1 mm/step **0.0 mm**
2-103*		LD Power Adjustment	Adjusts the LD power. ***Do not change the value.***	0 ~ 255 1 /step **129**
2-106*		ID Adjustment for Test Pattern	Adjusts the image density level for black pixels on test pattern printouts (patterns are made with SP5-902). *This SP affects all test patterns except for the grayscale test patterns.*	0 ~ 255 1 /step **255**
2-201*	1	Development Bias Adjustment (Printing)	Adjusts the development bias during printing. *This can be adjusted as a temporary measure if faint copies appear due to an aging drum.*	-1500 ~ -2000 1 V/step **–600 V**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-201*	2	Development Bias Adjustment (ID sensor pattern)	Adjusts the development bias for making the ID sensor pattern. The actual development voltage for the ID sensor pattern is this value plus the value of SP2-201-1. *This should not be used in the field, because it affects ID sensor pattern density, which affects toner supply. However, see 'Troubleshooting – Toner Density' for one occasion when this SP mode can be used.*	**0: N (200V)** 1: H (240V) 2: L (160V) 3: HH (280V) 4: LL (120V)
2-213*		Copies after Near End	Selects the number of copies that can be made after toner near-end has been detected. *If the user normally makes copies with a high proportion of black, reduce the interval.*	**0: 50 pages** 1: 20 pages
2-220*		Vt/Vsg/Vsp/Vsdp Data Display	Displays the Vt, Vsg, Vsp, and Vsdp values. *The Vt values are displayed as follows: e.g. Vt2.14/2.29 The left value is the actual TD sensor output. The right value is the target Vref value.*	**0: No** 1: Yes
2-221*		ID Sensor Error Display	Displays the Vsg, Vsp, Power, Vsg-Vsp, and Vt values for ID sensor error conditions. See "ID Sensor Error Analysis" later in this section for more detail. *There is no SC code for the ID sensor error in this machine. Check the ID sensor values with this SP if abnormal copies are made (such as dirty background) to determine whether the problem is due to incorrect toner density control.*	
2-301*	1*	Transfer Current (Paper Tray Feed)	Adjusts the current applied to the transfer roller during copying from a paper tray when the user uses the "Normal" paper setting. *If the user normally feeds thicker paper from a paper tray, use a higher setting.*	0: –2 µA **1: 0 µA** 2: +2 µA 3: +4 µA
	2*	Transfer Current (By-pass Feed)	Adjusts the current applied to the transfer roller during copying from the by-pass tray. These settings are also used if the 2nd tray is used and special paper is selected with the switch in the tray. *If the user normally feeds thicker paper from the by-pass tray/2nd tray (special paper), use a higher setting. If waste toner is re-attracted from the drum (this can occur when using an OHP sheet), use a higher setting.*	0: –2 µA **1: 0 µA** 2: +2 µA 3: +4 µA

Service Tables

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-301*	3*	Transfer Current (Duplex)	Adjusts the current applied to the transfer roller during copying from the duplex unit when the user uses the "Normal" paper setting. *Use this SP when the image on the rear side of the paper has a problem caused by poor image transfer.*	0: –2 μA **1: 0 μA** 2: +2 μA 3: +4 μA
	4*	Transfer Current (Cleaning)	Adjusts the current applied to the transfer roller during roller cleaning. *If toner remains on the roller after cleaning (dirty background appears on the rear side of the paper), increase the current.*	0 ~ –10 1 μA/step **–4 μA**
	5	Transfer Current (Input - Front)	This is for the designer's test purposes. ***Do not change the value.***	0 ~ 30 1 μA/step **0 μA**
	6	Transfer Current (Input - Rear)	This is for the designer's test purposes. ***Do not change the value.***	0 ~ 30 1 μA/step **0 μA**
2-802		Developer Initialization	Initializes the developer and checks Vt. The machine mixes the developer for 2 minutes and while doing this, it reads and displays the TD sensor output (Vt). It does not initialize the TD sensor output. *If the machine has not been used for a long time, prints may have a dirty background. In this case, use this SP mode to mix the developer. After finishing, press the ⌦ key to remove the Vt data from the screen.*	**0: No** 1: Yes
2-901*	1	Separation Voltage Adjustment (Front – Leading Edge)	Adjusts the voltage that is applied to the separation plate during printing at the leading edge of the paper on the front side. *If the copies have pawl marks at the leading edge, increase this voltage.*	-1000 ~ -4000 1 V/step **–1800 V**
	2	Separation Voltage Adjustment (Front – Image Area)	Adjusts the voltage that is applied to the separation plate during printing on the image area of the paper on the front side. *If the copies have pawl marks in the image area, increase this voltage.*	-1000 ~ -4000 1 V/step **–1800 V**
	3	Separation Voltage Adjustment (Rear – Front)	Adjusts the voltage applied to the separation plate, during printing at the leading edge of the paper on the rear side. *See SP2-901-1.*	-1000 ~ -4000 1 V/step **–2100 V**
	4	Separation Voltage Adjustment (Rear – Image Area)	Adjusts the voltage applied to the separation plate, during printing at the image area of the paper on the rear side. *See SP2-901-2.*	-1000 ~ -4000 1 V/step **–2100 V**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-902*		FCI Smoothing	Selects whether the FCI smoothing function to remove jagged edges is enabled or disabled. *FCI smoothing is only used with the Sharp Text setting in text mode with binary picture processing.*	**0: No (Disabled)** 1: Yes (Enabled)
2-905		Gradation Type	This is for the designer's test purposes. **Do not change the value.**	**0: System** 1: 400 dpi 2: None 3: 600 dpi
2-906*	1	Tailing Correction (Shift Value)	Shifts the image across the page at the interval specified by SP 2-906-2. *When making many copies of an original that contains vertical lines (such as a table), separation may not work correctly, then a tailing image will occur (ghosts of the vertical lines will continue past the bottom of the table). This SP prevents this problem.*	0.0 ~ 1.0 0.1 mm/step **0.0 mm**
	2	Tailing Correction (Interval)	Changes the interval for the image shift specified by SP2-906-1.	1 ~ 10 1 page/step **1 page**
2-908		Forced Toner Supply	Forces the toner bottle to supply toner to the toner supply unit. Press "1" to start. *During this process, the machine supplies toner until the toner concentration in the development unit reaches a standard level. However, if the toner concentration does not reach a standard level, the machine supplies toner for 2 minutes maximum.*	**0: No** 1: Yes
2-915*		Polygon Motor Idling Time	Selects the polygon motor idling time. *If the user sets an original, touches a key, or opens the platen cover/DF, the polygon motor starts idling to make a faster first copy. However, with the default (15 s), the motor stops if the user does nothing for 15 s, and stops 15 s after the end of a job.* *If set at "0", the polygon motor never turns off during stand-by. However, when the machine goes into energy saver mode, the polygon motor turns off regardless of this timer.*	0: None **1: 15 s** 2: 25 s
2-921*		Toner Supply Mode	Selects the toner supply mode. *Normally, only use setting 0. Change to 3 temporarily if the TD sensor is defective. Do not use settings 1 and 2; these are for designer's use only.*	**0: Sensor 1** 1: Sensor 2 2: Fixed 1 3: Fixed 2

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-922*		Toner Supply Time	Adjusts the toner supply motor on time for sensor supply mode. This SP is effective only when SP2-921 is "0" or "1". *Increasing this value increases the toner supply motor on time. So, use a high value if the user tends to make lots of copies that have a high proportion of black.*	0.1 ~ 5.0 0.1 s/step **0.6 s**
2-923*		Toner Recovery Time	Adjusts the toner supply motor on time during recovery from toner near-end/end. This SP is effective only when SP2-921 is "0", "1", or "2". *Note that toner recovery is done in a 3-second cycle. So, the input value should be a multiple of 3 (e.g. 3, 6 ,9). See "Toner Density Control" for more details.*	3 ~ 60 1 s/step **30 s**
2-925*		Toner Supply Rate	Adjusts the toner supply rate for fixed toner supply mode. This SP is effective only when SP2-921 is "2" or "3". *Increasing this value increases the toner supply motor on time. So, use a high value if the user tends to make lots of copies that have a high proportion of black. See "Toner Density Control" for more details.* 0: t 4: 12t 1: 2t 5: 16t 2: 4t 6: On continuously 3: 8t 7: 0 s t: 200 ms	0 ~ 7 1/step **0**
2-926*		Standard Vt	Adjusts Vts (Vt for a new PCU). The TD sensor output is adjusted to this value during the TD sensor initial setting process. This SP is effective only when SP2-921 is "0", "1", or "2". ***Do not change this value.***	0.00 ~ 5.00 0.01 V/step **2.30 V**
2-927*		ID Sensor Control	Selects whether the ID sensor is used or not for toner density control. *If this value is "0", dirty background may occur after the machine has not been used for a long time.*	0: No **1: Yes**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-928*		Toner End Clear	Clears the toner end condition. Select "1" then press the # key to clear the toner end condition without adding new toner. *If this is "1", the following are cleared.* • *Toner end indicator (goes out)* • *Toner near-end counter* • *Toner near-end level* *When making a lot of copies after changing this setting to "1", the carrier may be attracted to the drum when the toner runs out, which may damage the drum.*	**0: No** 1: Yes
2-929*	1	Vref Upper Limit	Adjusts the upper limit for Vref. *When there is dirty background on the copy, change this value to around 3.1 V.*	0.00 ~ 5.00 0.01 V/step **2.80 V**
	2	Vref Lower Limit	Adjusts the lower limit for Vref.	0.00 ~ 5.00 0.01 V/step **1.10 V**
2-992*		Copies After TD Sensor Error	Selects the number of copies that can be made after a TD sensor error has been detected. When the machine copies this amount, an SC condition will occur. *If the optional fax unit is installed, the SC condition occurs immediately regardless of the number of prints (this is because the sender of the fax cannot check the image quality of the printout).*	**0: 100 copies** 1: 200 copies
2-995*		ID Sensor Detection Interval	If the machine starts warming-up after this time has passed since entering night mode (for example, to print an incoming fax), the machine makes an ID sensor pattern. *If this value is greater, there is a greater chance that background will become dirty.*	0 ~ 999 1 minute/step **30 minutes**
2-996*		Transfer Roller Cleaning	Selects whether the transfer roller is cleaned before each copy job. *Set this to '1' when dirty background appears on the reverse side of the first page of a copy job. However, the first copy time will be longer.* *If this SP is at 0, the transfer roller is never cleaned.* *See 'Detailed Section Descriptions – Transfer Roller Cleaning" for more details.*	**0: No** 1: Yes

Mode No.			Function	Settings
Class 1 and 2	Class 3			
2-998*	1	Main Scan Magnification (Engine)	Adjusts the magnification in the main scan direction for the engine. *Use the # key to toggle between + and - before entering the value. The specification is ± 0.5%.* *This SP value affects all print modes (copy, printer, and image rotation). If the main scan magnification is not correct for copying, also use SP2-998-2. For image rotation, use SP2-998-3.* See "Replacement and Adjustment - Copy Adjustment" for details.	-0.5 ~ +0.5 0.1 %/step **0.0 %**
	2	Main Scan Magnification (Copy)	Adjusts the magnification in the main scan direction for copying. *This SP affects only copying. It is added to the value of 2-998-1.*	-0.5 ~ +0.5 0.1 %/step **0.0 %**
	3	Main Scan Magnification (Image Rotation)	Adjusts the magnification in the main scan direction for copying with image rotation mode. *This SP affects only image rotation mode. It is added to the value of 2-998-1.*	-0.5 ~ +0.5 0.1 %/step **0.0 %**
4-008*	1	Main Scan Magnification (Scanner)	Adjusts the magnification in the main scan direction for scanning. *Use the # key to toggle between + and - before entering the value. The specification is ± 1%. See "Replacement and Adjustment - Copy Adjustment" for details.*	–1.0 ~ +1.0 0.1 %/step **0.0%**
4-010*		Leading Edge Registration (Scanner)	Adjusts the leading edge registration for scanning in platen mode. *(–): The image moves in the direction of the leading edge.* *Use the # key to toggle between + and - before entering the value. The specification is 2 ± 1.5 mm. See "Replacement and Adjustment - Copy Adjustment" for details.*	–5.0 ~ +9.0 0.1 mm/step **0.0 mm**
4-011*		Side-to-side Registration (Scanner)	Adjusts the side-to-side registration for scanning in platen mode. *(–): The image disappears at the left side.* *(+): The image appears.* *Use the # key to toggle between + and - before entering the value. The specification is 2 ± 1.5 mm. See "Replacement and Adjustment - Copy Adjustment" for details.*	–10.0 ~ +6.0 0.1 mm/step **0.0 mm**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-012*	1	Erase Margin (Leading Edge)	Adjusts the erase margin at each side for scanning. *Do not adjust this unless the user wishes to have a scanner margin that is greater than the printer margin.*	0 ~ 9.0 0.1 mm/step **1.0 mm**
	2	Erase Margin (Trailing Edge)		0 ~ 9.0 0.1 mm/step **1.0 mm**
	3	Erase Margin (Left Side)		0 ~ 9.0 0.1 mm/step **1.0 mm**
	4	Erase Margin (Right Side)		0 ~ 9.0 0.1 mm/step **1.0 mm**
4-013		Scanner Free Run	Performs a scanner free run with the exposure lamp on. *After selecting "1", press "OK" or the # key twice to start this feature. Press the C/C (Clear/Stop) key to stop.*	**0: No** 1: Yes
4-015*	1	White Plate Scanning (Start Position)	Adjusts the scanning start position on the white plate for auto shading. *The default is 6 mm from the leading edge. The setting specifies how far scanning starts from the default position.*	– 3.0 ~ + 6.0 0.1 mm/step **0.0 mm**
	2	White Plate Scanning (Scanning Area)	Adjusts the width of the area on the white plate (in the sub scan direction) that is scanned for auto shading. *The default is 5 mm. The current setting specifies the difference from this default.*	– 3.0 ~ + 6.0 0.1 mm/step **0.0 mm**
4-101*		Sub Scan Magnification (Scanner)	Adjusts the magnification in the sub scan direction for scanning. If this value is changed, the scanner motor speed is changed. *Use the */- key to toggle between + and - before entering the value. The specification is ± 0.5%. See "Replacement and Adjustment - Copy Adjustment" for details.*	– 0.9 ~ + 0.9 0.1%/step **0.0%**
4-301		APS Data Display	Displays the status of the APS sensors and platen/DF cover sensor. *See "APS and Platen/ADF Cover Sensor Output Display" after the SP mode table.*	
4-303*		APS Small Size Original	Selects whether the copier determines that the original is A5 size when the APS sensor cannot detect the size. *If "A5 lengthwise" is selected, paper sizes that cannot be detected by the APS sensors are regarded as A5 lengthwise. If "Not detected" is selected, "Cannot detect original size" will be displayed.*	**0: No (Not detected)** 1: Yes (A5 lengthwise)

Service Tables

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-401*		Image Mode Selection	Selects whether the binary processing is always used in Positive/Negative mode. *0: The machine uses the process selected by the user with user tools.* *1: The machine always uses binary picture processing; greyscale processing is disabled.*	**0: System** 1: Binary
4-412*		IPU Image Data Path	Selects one of the following video data outputs, which will be used for printing. **0. N: Normal video processing** 1. S: After auto shading processing 2. M: After magnification processing 3. F: After MTF processing 4. G: After gamma correction 5. T: Data straight through (no video processing)	
			Do not change the value.	
4-417		IPU/SBU Test Pattern	Prints test patterns from the IPU or SBU video data outputs. (1 ~ 13: IPU, 14 ~ 16: SBU) **0. No Print** 1. Vertical Line - 1 dot 2. Horizontal Line - 1 dot 3. Vertical Line - 2 dot 4. Horizontal Line - 2 dot 5. Alternating Dot Pattern 6. Grid Pattern - 1 dot 7. Vertical Bands 8. Grayscale - Horizontal 9. Grayscale - Vertical 10. Patch Pattern 11. Cross Pattern 12. Slant Pattern 13. Trimming Area 14. Vertical Line - 2 dot 15. Grid Pattern - 2 dot 16. 16-grayscale	
			Change to the copy mode display by pressing the ⏎ (Interrupt) key, then print the test pattern.	
4-902		Exposure Lamp ON	Turns on the exposure lamp.	**0: No (Off)** 1: Yes (On)
			To turn off the exposure lamp, select "0".	
4-904	1*	SBU Gain Adjustment (EVEN)	Checks the difference value of the black level for the EVEN channel after adjusting the black level at power-up.	0 ~ 255 1/step **40**
			Do not change the value. *However, after doing a memory all clear (SP5-801), use it to re-input the previous value.*	

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-904	2*	SBU Gain Adjustment (ODD)	Checks the difference value of the black level for the ODD channel after adjusting the black level at power-up. ***Do not change the value.*** *However, after doing a memory all clear (SP5-801), use it to re-input the previous value.*	0 ~ 255 1/step **40**
	3	SBU Gain Adjustment (Adjusted EVEN)	Checks the difference value of the black level for the EVEN channel after adjusting the black level at SBU Auto Adjustment (SP4-908). ***Do not change the value.***	0 ~ 255 1/step **40**
	4	SBU Gain Adjustment (Adjusted ODD)	Checks the difference value of the black level for the ODD channel after adjusting the black level at SBU Auto Adjustment (SP4-908). ***Do not change the value.***	0 ~ 255 1/step **40**
4-905*	1	SBU DC Cont Adjustment (EVEN)	Adjusts the coefficient of the D/A converter for the AGC gain curve for DC cont for the EVEN channel. ***Do not change the value.*** *However, after doing a memory all clear (SP5-801), use it to re-input the previous value.*	0 ~ 255 1/step **25**
	2	SBU DC Cont Adjustment (ODD)	Adjusts the coefficient of the D/A converter for the AGC gain curve for DC cont for the ODD channel. ***Do not change the value.*** *However, after doing a memory all clear (SP5-801), use it to re-input the previous value.*	0 ~ 255 1/step **25**
4-906	1	SBU Ref. Value Adjustment (Current Value)	Adjusts the coefficient of the D/A converter for the AGC gain curve for scanning the white plate. ***Do not change the value.***	0 ~ 255 1/step **147**
	2	SBU Ref. Value Adjustment (Loop)	Displays the number of convergences for SBU reference control. ***Do not use in the field.***	0 ~ 255 1/step **0**
4-907*	1	SBU Offset Value Adjustment (EVEN)	Adjusts the coefficient of the D/A converter for the offset (Z/C) for the analog image data processing for EVEN. ***Do not change the value.*** *However, after performing the memory all clear (SP5-801), use it to re-input the previous value.*	0 ~ 255 1/step **180**
4-907*	2	SBU Offset Value Adjustment (ODD)	Adjusts the coefficient of the D/A converter for the offset (Z/C) for the analog image data processing for ODD. ***Do not change the value.*** *However, after performing the memory all clear (SP5-801), use it to re-input the previous value.*	0 ~ 255 1/step **180**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-908		SBU Auto Adjustment	Performs the auto scanner adjustment. *Using this SP mode after replacing the white plate or erasing the memory on the BICU board. See "Replacement and Adjustment – Copy Image Adjustments - Standard White Density Adjustment" for details on how to do this.*	**0: No (Normal operation)** 1: Yes (Start the adjustment)
4-909		SBU AE Cont Adjustment	Adjusts the background density when ADS mode is not being used. ***Do not change the value.***	0 ~ 255 1/step **209**
4-910*		Scanner Motor Control	Selects the scanner motor control method. *If "1" is selected, the current for the scanner motor will be reduced and jitter copy quality problems will be alleviated. However, copy speed will be reduced.* ***Normally do not change the value.***	**0: Normal** 1: Special
4-913*		DF Shading Interval Time	Adjusts the interval for shading processing in DF mode. *Light and heat may affect the scanner response. If copy quality indicates that white level is drifting during a DF copy job, reduce this setting. This setting is only effective when the setting of SP4-950 is "ADAM".*	0 ~ 60 1 s/step **30 s**
4-915*	1	P - MTF Coefficient (Text /Grayscale /Main /25%~29%)	This adjustment is only effective for the "Service Mode" original type setting. Selects the MTF filter coefficient in the grayscale processing mode. See "Detailed Descriptions - Image Processing" for details. T/P: Text/Photo	0 ~ 15 1/step **1**
	2	P - MTF Coefficient (Text /Grayscale /Main /30%~76%)		0 ~ 15 1/step **1**
	3	P - MTF Coefficient (Text /Grayscale /Main /77%~154%)		0 ~ 15 1/step **3**
	4	P - MTF Coefficient (Text /Grayscale /Main /155%~256%)		0 ~ 15 1/step **3**
	5	P - MTF Coefficient (Text /Grayscale /Main /257%~)		0 ~ 15 1/step **15**
	6	P - MTF Coefficient (Text /Grayscale /Sub /25%~29%)		0 ~ 15 1/step **2**
	7	P - MTF Coefficient (Text /Grayscale /Sub /30%~76%)		0 ~ 15 1/step **2**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-915*	8	P - MTF Coefficient (Text /Grayscale /Sub /77%~154%)	This adjustment is only effective for the "Service Mode" original type setting. Selects the MTF filter coefficient in the grayscale processing mode. See "Detailed Descriptions - Image Processing" for details. T/P: Text/Photo	0 ~ 15 1/step **3**
	9	P - MTF Coefficient (Text /Grayscale /Sub /155%~256%)		0 ~ 15 1/step **3**
	10	P - MTF Coefficient (Text /Grayscale /Main /257%~)		0 ~ 15 1/step **12**
	11	P - MTF Coefficient (T/P /Grayscale /Main /25%~57%)		0 ~ 15 1/step **3**
	12	P - MTF Coefficient (T/P /Grayscale /Main /58%~65%)		0 ~ 15 1/step **3**
	13	P - MTF Coefficient (T/P /Grayscale /Main /66%~76%)		0 ~ 15 1/step **3**
	14	P - MTF Coefficient (T/P /Grayscale /Main /77%~154%)		0 ~ 15 1/step **3**
	15	P - MTF Coefficient (T/P /Grayscale /Main /155%~256%)		0 ~ 15 1/step **3**
	16	P - MTF Coefficient (T/P /Grayscale /Main /257%~)		0 ~ 15 1/step **3**
	17	P - MTF Coefficient (T/P /Grayscale /Sub /25%~57%)		0 ~ 13 1/step **3**
	18	P - MTF Coefficient (T/P /Grayscale /Sub /58%~65%)		0 ~ 13 1/step **3**
	19	P - MTF Coefficient (T/P /Grayscale /Sub /66%~76%)		0 ~ 13 1/step **3**
	20	P - MTF Coefficient (T/P /Grayscale /Sub /77%~154%)		0 ~ 13 1/step **3**
	21	P - MTF Coefficient (T/P /Grayscale /Sub /155%~256%)		0 ~ 13 1/step **3**
	22	P - MTF Coefficient (T/P /Grayscale /Sub /257%~)		0 ~ 13 1/step **3**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-915*	23	P - MTF Coefficient (Text /Binary /Main /25%~49%)	This adjustment is only effective for the "Service Mode" original type setting. Selects the MTF filter coefficient in the binary picture processing mode. See "Detailed Descriptions - Image Processing" for details. T/P: Text/Photo	0 ~ 15 1/step **1**
	24	P - MTF Coefficient (Text /Binary /Main /50%~95%)		0 ~ 15 1/step **1**
	25	P - MTF Coefficient (Text /Binary /Main /96%~125%)		0 ~ 15 1/step **1**
	26	P - MTF Coefficient (Text /Binary /Main /126%~159%)		0 ~ 15 1/step **3**
	27	P - MTF Coefficient (Text /Binary /Main /160%~200%)		0 ~ 15 1/step **4**
	28	P - MTF Coefficient (Text /Binary /Main /201%~)		0 ~ 15 1/step **4**
	29	P - MTF Coefficient (Text /Binary /Sub /25%~49%)		0 ~ 15 1/step **2**
	30	P - MTF Coefficient (Text /Binary /Sub /50%~95%)		0 ~ 15 1/step **2**
	31	P - MTF Coefficient (Text /Binary /Sub /96%~125%)		0 ~ 15 1/step **2**
	32	P - MTF Coefficient (Text /Binary /Sub /126%~159%)		0 ~ 15 1/step **3**
	33	P - MTF Coefficient (Text /Binary /Sub /160%~200%)		0 ~ 15 1/step **4**
	34	P - MTF Coefficient (Text /Binary /Sub /201%~)		0 ~ 15 1/step **4**
	35	P - MTF Coefficient (T/P /Binary /Main /25%~49%)		0 ~ 15 1/step **3**
	36	P - MTF Coefficient (T/P /Binary /Main /50%~89%)		0 ~ 15 1/step **3**
	37	P - MTF Coefficient (T/P /Binary /Main /90%~95%)		0 ~ 15 1/step **3**
	38	P - MTF Coefficient (T/P /Binary /Main /96%~125%)		0 ~ 15 1/step **1**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-915*	39	P - MTF Coefficient (T/P /Binary /Main /126%~159%)	This adjustment is only effective for the "Service Mode" original type setting. Selects the MTF filter coefficient in the binary picture processing mode. See "Detailed Descriptions - Image Processing" for details. T/P: Text/Photo	0 ~ 15 1/step **1**
	40	P - MTF Coefficient (T/P /Binary /Main /160%~200%)		0 ~ 15 1/step **1**
	41	P - MTF Coefficient (T/P /Binary /Main /201%~)		0 ~ 15 1/step **1**
	42	P - MTF Coefficient (T/P /Binary /Sub /25%~49%)		0 ~ 15 1/step **3**
	43	P - MTF Coefficient (T/P /Binary /Sub /50%~89%)		0 ~ 15 1/step **3**
	44	P - MTF Coefficient (T/P /Binary /Sub /90%~95%)		0 ~ 15 1/step **3**
	45	P - MTF Coefficient (T/P /Binary /Sub /96%~125%)		0 ~ 15 1/step **2**
	46	P - MTF Coefficient (T/P /Binary /Sub /126%~159%)		0 ~ 15 1/step **2**
	47	P - MTF Coefficient (T/P /Binary /Sub /160%~200%)		0 ~ 15 1/step **2**
	48	P - MTF Coefficient (T/P /Binary /Sub /201%~)		0 ~ 15 1/step **2**
4-916*	1	P - MTF Strength (Text /Grayscale /Main /25%~29%)	This adjustment is only effective for the "Service Mode" original type setting. Selects the MTF strength using grayscale processing mode. See "Detailed Descriptions - Image Processing" for details. Weak Strong 1-2-3-4-5-0(x1)-6-7 T/P: Text/Photo	0 ~ 7 1/step **5**
	2	P - MTF Strength (Text /Grayscale /Main /30%~76%)		0 ~ 7 1/step **5**
	3	P - MTF Strength (Text /Grayscale /Main /77%~154%)		0 ~ 7 1/step **5**
	4	P - MTF Strength (Text /Grayscale /Main /155%~256%)		0 ~ 7 1/step **5**
	5	P - MTF Strength (Text /Grayscale /Main /257%~)		0 ~ 7 1/step **4**
	6	P - MTF Strength (Text /Grayscale /Sub /25%~29%)		0 ~ 7 1/step **5**
	7	P - MTF Strength (Text /Grayscale /Sub /30%~76%)		0 ~ 7 1/step **5**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-916*	8	P - MTF Strength (Text /Grayscale /Sub /77%~154%)	This adjustment is only effective for the "Service Mode" original type setting. Selects the MTF strength using grayscale processing mode. See "Detailed Descriptions - Image Processing" for details. Weak Strong 1-2-3-4-5-0(x1)-6-7 T/P: Text/Photo	0 ~ 7 1/step **5**
	9	P - MTF Strength (Text /Grayscale /Sub /155%~256%)		0 ~ 7 1/step **5**
	10	P - MTF Strength (Text /Grayscale /Sub /257%~)		0 ~ 7 1/step **4**
	11	P - MTF Strength (T/P /Grayscale /Main /25%~57%)		0 ~ 7 1/step **4**
	12	P - MTF Strength (T/P /Grayscale /Main /58%~65%)		0 ~ 7 1/step **5**
	13	P - MTF Strength (T/P /Grayscale /Main /66%~76%)		0 ~ 7 1/step **4**
	14	P - MTF Strength (T/P /Grayscale /Main /77%~154%)		0 ~ 7 1/step **4**
	15	P - MTF Strength (T/P /Grayscale /Main /155%~256%)		0 ~ 7 1/step **4**
	16	P - MTF Strength (T/P /Grayscale /Main /157%~)		0 ~ 7 1/step **4**
	17	P - MTF Strength (T/P /Grayscale /Sub /25%~57%)		0 ~ 7 1/step **4**
	18	P - MTF Strength (T/P /Grayscale /Main /58%~65%)		0 ~ 7 1/step **5**
	19	P - MTF Strength (T/P /Grayscale /Sub /66%~76%)		0 ~ 7 1/step **4**
	20	P - MTF Strength (T/P /Grayscale /Sub /77%~154%)		0 ~ 7 1/step 4
	21	P - MTF Strength (T/P /Grayscale /Sub /155%~256%)		0 ~ 7 1/step **4**
	22	P - MTF Strength (T/P /Grayscale /Sub /157%~)		0 ~ 7 1/step **4**
	23	P - MTF Strength (Text /Binary /Main /25%~49%)		0 ~ 7 1/step **4**
	24	P - MTF Strength (Text /Binary /Main /50%~95%)		0 ~ 7 1/step **4**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-916*	25	P - MTF Strength (Text /Binary /Main /96%~125%)	This adjustment is only effective for the "Service Mode" original type setting. Selects the MTF strength using grayscale processing mode. See "Detailed Descriptions - Image Processing" for details. Weak Strong 1-2-3-4-5-0(x1)-6-7 T/P: Text/Photo	0 ~ 7 1/step **5**
	26	P - MTF Strength (Text /Binary /Main /126%~159%)		0 ~ 7 1/step **5**
	27	P - MTF Strength (Text /Binary /Main /160%~200%)		0 ~ 7 1/step **5**
	28	P - MTF Strength (Text /Binary /Main /201%~)		0 ~ 7 1/step **5**
	29	P - MTF Strength (Text /Binary /Sub /25%~49%)		0 ~ 7 1/step **4**
	30	P - MTF Strength (Text /Binary /Sub /50%~95%)		0 ~ 7 1/step **4**
	31	P - MTF Strength (Text /Binary /Sub /96%~125%)		0 ~ 7 1/step **5**
	32	P - MTF Strength (Text /Binary /Sub /126%~159%)		0 ~ 7 1/step **5**
	33	P - MTF Strength (Text /Binary /Sub /160%~200%)		0 ~ 7 1/step **5**
	34	P - MTF Strength (Text /Binary /Sub /201%~)		0 ~ 7 1/step **5**
	35	P - MTF Strength (T/P /Binary /Main /25%~49%)		0 ~ 7 1/step **3**
	36	P - MTF Strength (T/P /Binary /Main /50%~89%)		0 ~ 7 1/step **3**
	37	P - MTF Strength (T/P /Binary /Main /90%~95%)		0 ~ 7 1/step **3**
	38	P - MTF Strength (T/P /Binary /Main /96%~125%)		0 ~ 7 1/step **5**
	39	P - MTF Strength (T/P /Binary /Main /126%~159%)		0 ~ 7 1/step **5**
	40	P - MTF Strength (T/P /Binary /Main /160%~200%)		0 ~ 7 1/step **5**
	41	P - MTF Strength (T/P /Binary /Main /201%~)		0 ~ 7 1/step **5**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-916*	42	P - MTF Strength (T/P /Binary /Sub /25%~49%)	This adjustment is only effective for the "Service Mode" original type setting. Selects the MTF strength using binary picture processing mode. See "Detailed Descriptions - Image Processing" for details. Weak Strong 1-2-3-4-5-0(x1)-6-7 T/P: Text/Photo	0 ~ 7 1/step **3**
	43	P - MTF Strength (T/P /Binary /Sub /50%~89%)		0 ~ 7 1/step **3**
	44	P - MTF Strength (T/P /Binary /Sub /90%~95%)		0 ~ 7 1/step **3**
	45	P - MTF Strength (T/P /Binary /Sub /96%~125%)		0 ~ 7 1/step **5**
	46	P - MTF Strength (T/P /Binary /Sub /126%~159%)		0 ~ 7 1/step **5**
	47	P - MTF Strength (T/P /Binary /Sub /160%~200%)		0 ~ 7 1/step **5**
	48	P - MTF Strength (T/P /Binary /Sub /201%~)		0 ~ 7 1/step **5**
4-917*	1	P - Independent Dot Erase (Text - Grayscale)	**This adjustment is only effective for the "Service Mode" original type setting.** Selects the independent dot erase level. See "Detailed Descriptions - Image Processing" for details. With a larger SP setting, more dots are detected as independent dots and erased. However, dots in mesh-like images may be detected as independent dots mistakenly. If "0" is selected, independent dot erase is disabled.	0 ~ 9 1/step **7**
	2	P - Independent Dot Erase (Text/Photo - Grayscale)		0 ~ 9 1/step **3**
	3	P - Independent Dot Erase (Text - Binary)		0 ~ 9 1/step **7**
	4	P - Independent Dot Erase (Text/Photo - Binary)		0 ~ 9 1/step **3**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-918*	1	P - White Line Erase (Text - Grayscale)	**This adjustment is only effective for the "Service Mode" original type setting.** Selects whether or not white line erase is done. See "Detailed Descriptions - Image Processing" for details.	0: No **1: Yes**
	2	P - White Line Erase (Text/Photo - Grayscale)		0: No **1: Yes**
	3	P - White Line Erase (Photo - Grayscale)		0: No **1: Yes**
	4	P - White Line Erase (Text - Binary)		0: No **1: Yes**
	5	P - White Line Erase (Text/Photo - Binary)		0: No **1: Yes**
	6	P - White Line Erase (Photo - Binary)		0: No **1: Yes**
4-919*	1	P - Black Line Erase (Text - Grayscale)	**This adjustment is only effective for the "Service Mode" original type setting.** Selects the black line erase level. This SP is effective only scanning the original using the ADF. See "Detailed Descriptions - Image Processing" for details.	0: Disable **1: Strong** 2: Weak
	2	P - Black Line Erase (Text/Photo - Grayscale)		0: Disable **1: Strong** 2: Weak
	3	P – Black Line Erase (Photo - Grayscale)		0: Disable **1: Strong** 2: Weak
	4	P - Black Line Erase (Text - Binary)		0: Disable **1: Strong** 2: Weak
	5	P - Black Line Erase (Text/Photo - Binary)		0: Disable **1: Strong** 2: Weak
	6	P - Black Line Erase (Photo - binary)		0: Disable **1: Strong** 2: Weak
4-921*	1	P - Smoothing - Main Scan (Text - Grayscale)	**This adjustment is only effective for the "Service Mode" original type setting.** Selects the smoothing pattern for the small filter used to remove moiré. (0: Weak, 1: Normal, 2: Strong, 3: Disabled). See "Detailed Descriptions - Image Processing" for details. **Normally do not change the value.**	0: Pat-1 **1: Pat-2** 2: Pat-3 3: Through (Disable)

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-921*	2	P - Smoothing - Main Scan (Text/Photo - Grayscale)	**This adjustment is only effective for the "Service Mode" original type setting.** Selects the smoothing pattern for the small filter used to remove moiré. (0: Weak, 1: Normal, 2: Strong, 3: Disabled). See "Detailed Descriptions - Image Processing" for details. **Normally do not change the value.**	0: Pat-1 **1: Pat-2** 2: Pat-3 3: Through (Disable)
	3	P - Smoothing - Main Scan (Text - Binary)		0: Pat-1 **1: Pat-2** 2: Pat-3 3: Through (Disable)
	4	P - Smoothing - Main Scan (Text/Photo - Binary)		0: Pat-1 **1: Pat-2** 2: Pat-3 3: Through (Disable)
4-922*	1	P - Binary Selection (Text)	**This adjustment is only effective for the "Service Mode" original type setting.** Selects the thresholding type used during gradation processing (dynamic or constant). Only used for binary picture processing. See "Detailed Description - Image Processing" for details. **Normally do not change the value.**	**0: Dynamic** 1: Static
	2	P - Binary Selection (Text/Photo)		0: Dynamic **1: Static**
4-923*		P - Binary Threshold	Adjusts the constant threshold used during binary picture processing. ***This adjustment is only effective for the "Text - Service Mode" original type setting.*** *If "Static" is selected with SP4-922-1, this SP is effective. See "Detailed Descriptions - Image Processing" for details.*	0 ~ 255 1/step **96**
4-924*		P – Binary Threshold - MAX	Adjusts the maximum value of the dynamic binary threshold used at the edges of text elements. Only used for binary picture processing. ***This adjustment is only effective for the "Text - Service Mode" original type setting.*** *If "Dynamic Binary" is selected with SP4-922-1, this SP is effective. See "Detailed Descriptions - Image Processing" for details.*	0 ~ 255 1/step **160**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-925*		P – Binary Threshold - MIN	Adjusts the minimum value of the dynamic binary threshold used at the edges of text elements. Only used for binary picture processing. ***This adjustment is only effective for the "Text - Service Mode" original type setting.*** *If "Dynamic Binary" is selected with SP4-922-1, this SP is effective. See "Detailed Descriptions - Image Processing" for details.*	0 ~ 255 1/step **96**
4-926*		P - Binary Threshold - Center	Adjusts the threshold in dynamic binary mode for pixels not on edges of text/graphic elements. Only used for binary picture processing. ***This adjustment is only effective for the "Text - Service Mode" original type setting.*** *If "Dynamic Binary" is selected with SP4-922-1, this mode is enabled. See "Detailed Descriptions - Image Processing" for details.*	0 ~ 255 1/step **96**
4-927*	1	P - Smoothing Filter (Photo - Grayscale)	**This adjustment is only effective for the "Service Mode" original type setting for Photo mode.** Adjusts the smoothing filter level. If "0" is selected, smoothing is disabled. See "Detailed Descriptions - Image Processing" for details. Weakest Strongest 1 – 2 – 0 – 3 – 4 – 5 – 6 – 7 – 8	0 ~ 8 1/step **3**
	2	P - Smoothing Filter (Photo – Binary)		0 ~ 8 1/step **7**
4-928*	1	P - Scanner Gamma (Text - Grayscale)	**This adjustment is only effective for the "Service Mode" original type setting.** Selects the scanner gamma curve. If "0" is selected, the scanner gamma curve is either AE or NAE, depending on the setting for the other original types in the same mode (e.g., AE linear for text-greyscale, as used when pale, normal, or generation modes are selected). See "Detailed Descriptions - Image Processing" for details. **Normally do not change the value.**	0: By key (as selected) 1: AE 2: NAE **3: Linear** 4: SP
	2	P - Scanner Gamma (Text/Photo - Grayscale)		**0: By key (as selected)** 1: AE 2: NAE 3: Linear 4: SP
	3	P - Scanner Gamma (Photo - Grayscale)		**0: By key (as selected)** 1: AE 2: NAE 3: Linear 4: SP

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-928*	4	P - Scanner Gamma (Text - Binary)	**This adjustment is only effective for the "Service Mode" original type setting.** Selects the scanner gamma curve. If "0" is selected, the scanner gamma curve is either AE or NAE, depending on the setting for the other original types in the same mode (e.g., AE linear for text-greyscale, as used when pale, normal, or generation modes are selected). See "Detailed Descriptions - Image Processing" for details. **Normally do not change the value.**	0: By key (as selected) 1: AE 2: NAE **3: Linear** 4: SP
	5	P - Scanner Gamma (Text/Photo - Binary)		**0: By key (as selected)** 1: AE 2: NAE 3: Linear 4: SP
	6	P - Scanner Gamma (Photo - Binary)		**0: By key (as selected)** 1: AE 2: NAE 3: Linear 4: SP
4-929*	1	P - Matrix Filter (Text - Grayscale)	Selects the error diffusion matrix filter in text mode with grayscale processing. ***This adjustment is only effective for the "Service Mode" original type setting.*** *See "Detailed Descriptions - Image Processing" for details.* ***Normally do not change the value.***	6: No.1 **7: No.2**
	2	P - Matrix Filter (Text/Photo - Grayscale)	Selects the error diffusion matrix filter in text/photo mode with grayscale processing. *See the comment for SP4-929-1.*	6: No.1 **7: No.2**
	3	P - Matrix Filter (Photo - Grayscale)	Selects the dither matrix filter in photo mode. A larger number increases the number of gradations, but may reduce the contrast. ***This adjustment is only effective for the "Service Mode" original type setting.*** *See "Detailed Descriptions - Image Processing" for details.*	0: 105 **1: 143** 2: 210 3: 270
	4	P - Matrix Filter (Text/Photo - Binary)	Selects the error diffusion matrix filter in text/photo mode (this SP is used only with dynamic thresholding). ***This adjustment is only effective for the "Service Mode" original type setting.*** *See "Detailed Descriptions - Image Processing" for details.* ***Normally do not change the value.***	**6: No.1** 7: No.2

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-929*	5	P - Matrix Filter (Photo - Binary)	Selects the dither matrix filter in photo mode. A larger number increases the number of gradations, but may reduce the contrast. 5: This is a special dither matrix, designed to emphasize the edges of graphic and text objects ***This adjustment is only effective for the "Service Mode" original type setting.*** *See "Detailed Descriptions - Image Processing" for details.*	0: 53 **1: 105** 2: 143 3: 210 4: 270 5: H
4-931*		P - Edge Threshold - Vertical	Adjusts the threshold for edge detection in each direction for dynamic thresholding. Only used for binary picture processing. ***This adjustment is only effective for the "Text - Service Mode" original type setting.*** *If "Dynamic Binary" is selected with SP4-922-1, this SP mode is effective. See "Detailed Descriptions - Image Processing" for details.* ***Normally do not change the value.*** Right: Diagonal - top right to bottom left Left: Diagonal - top left to bottom right	0 ~ 255 1/step **63**
4-932*		P - Edge Threshold - Horizontal		0 ~ 255 1/step **63**
4-933*		P - Edge Threshold - Right		0 ~ 255 1/step **63**
4-934*		P - Edge Threshold - Left		0 ~ 255 1/step **63**
4-935*	1	P - Line Width Correction (Text - Grayscale)	**This adjustment is only effective for the "Service Mode" original type setting.** Adjusts the line width. If "0" is selected, this mode is disabled. See "Detailed Descriptions - Image Processing" for details. Settings 1 to 3 make lines thinner. 1 has the greatest effect. Settings 4 to 9 make lines thicker. 9 has the greatest effect. Thinnest Thickest 1 – 2 – 3 – 0 – 4 – 5 – 6 – 7 – 8 – 9	0 ~ 9 1/step **0**
	2	P - Line Width Correction (Text/Photo - Grayscale)		0 ~ 9 1/step **8**
	3	P - Line Width Correction (Photo - Grayscale)		0 ~ 9 1/step **0**
	4	P - Line Width Correction (Text - Binary)		0 ~ 9 1/step **2**
	5	P - Line Width Correction (Text/Photo - Binary)		0 ~ 9 1/step **8**
	6	P - Line Width Correction (Photo - Binary)		0 ~ 9 1/step **0**

Service Tables

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-936*	1	P - SBU ADS Setting (Text - Grayscale)	**This adjustment is only effective for the "Service Mode" original type setting.** Selects whether the SBU ADS process is done. If "0" is selected, it depends on whether the user selects ADS at the operation panel. See "Detailed Descriptions - Image Processing" for details. **Normally do not change the value.**	**0: By key** 1: ON 2: OFF
	2	P - SBU ADS Setting (Text/Photo - Grayscale)		**0: By key** 1: ON 2: OFF
	3	P - SBU ADS Setting (Photo - Grayscale)		**0: By key** 1: ON 2: OFF
	4	P - SBU ADS Setting (Text - Binary)		**0: By key** 1: ON 2: OFF
	5	P - SBU ADS Setting (Text/Photo - Binary)		**0: By key** 1: ON 2: OFF
	6	P - SBU ADS Setting (Photo - Binary)		**0: By key** 1: ON 2: OFF
4-937*	1	P - IPU ADS Setting (Text - Grayscale)	**This adjustment is only effective for the "Service Mode" original type setting.** Selects whether the IPU ADS process is done. If "0" is selected, it depends on whether the user selects ADS at the operation panel. The value of SP4-938 is subtracted from the white video level. See "Detailed Description - Image Processing" for details. **Normally do not change the value.**	**0: By key** 1: ON 2: OFF
	2	P - IPU ADS Setting (Text/Photo - Grayscale)		**0: By key** 1: ON 2: OFF
	3	P - IPU ADS Setting (Photo - Grayscale)		**0: By key** 1: ON 2: OFF
	4	P - IPU ADS Setting (Text – Binary)		**0: By key** 1: ON 2: OFF
	5	P - IPU ADS Setting (Text/Photo - Binary)		**0: By key** 1: ON 2: OFF
	6	P - IPU ADS Setting (Photo - Binary)		**0: By key** 1: ON 2: OFF

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-938*	1	P - IPU ADS Adjustment (Text - Grayscale)	**This adjustment is only effective for the "Service Mode" original type setting.** Decides how much is subtracted from the white video level. In SP4-937, if "By key" is selected and the user selects ADS mode, or if "ON" is selected, this value is subtracted from the white video level. See "Detailed Description - Image Processing" for details. **Normally do not change the value.**	0 ~ 15 1/step **8**
	2	P - IPU ADS Adjustment (Text/Photo - Grayscale)		0 ~ 15 1/step **8**
	3	P - IPU ADS Adjustment (Photo - Grayscale)		0 ~ 15 1/step **8**
	4	P - IPU ADS Adjustment (Text - Binary)		0 ~ 15 1/step **8**
	5	P - IPU ADS Adjustment (Text/Photo - Binary)		0 ~ 15 1/step **8**
	6	P - IPU ADS Adjustment (Photo - Binary)		0 ~ 15 1/step **8**
4-939*		P - Binary Filter	Selects the binary filter for the independent dot erase that is done after image processing in text mode. ***This adjustment is only effective for the "Service Mode" original type setting for text mode.*** *If "0" is selected this mode is disabled. See "Detailed Descriptions - Image Processing" for details.* ***Normally do not change the value.***	**0: Non** 1: 3 x 3 2: 4 x 4 3: 5 x 5
4-940*	1	P - ID Gamma Adjustment (Text - Grayscale)	Selects the ID gamma curve. ***This adjustment is only effective for the "Service Mode" original type setting.*** *See "Detailed Descriptions - Image Processing" for details.* ***Normally do not change the value.***	**0: ed (Greyscale text)** 1: Linear
	2	P - ID Gamma Adjustment (Text/Photo - Grayscale)	Selects the ID gamma curve for error diffusion. ***This adjustment is only effective for the "Service Mode" original type setting.*** *See "Detailed Descriptions - Image Processing" for details.* ***Normally do not change the value.***	0: ch (Text normal) **1: ms (Text Priority)** 2: msp (Photo Priority) 3: t3 (Glossy Photo) 4: Linear

Service Tables

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-940*	3	P - ID Gamma Adjustment (Photo - Grayscale)	Selects the ID gamma curve for dithering. ***This adjustment is only effective for the "Service Mode" original type setting.*** *See "Detailed Descriptions - Image Processing" for details.* ***Normally do not change the value.***	5: 105 (Coarse Print) **6: 143 (Press Print)**
	4	P - ID Gamma Adjustment (Text - Binary)	Selects the ID gamma curve. ***This adjustment is only effective for the "Service Mode" original type setting.*** *See "Detailed Descriptions - Image Processing" for details.* ***Normally do not change the value.***	**0: B&W (Sharp text)** 1: Linear (Normal text)
	5	P - ID Gamma Adjustment (Text/Photo - Binary)	Selects the ID gamma curve for error diffusion. ***This adjustment is only effective for the "Service Mode" original type setting.*** *See "Detailed Descriptions - Image Processing" for details.* ***Normally do not change the value.***	1: Norm (Text) **2: ch (Text Priority)** 3: ph (Photo Priority) 4: ph2 (Glossy Photo)
	6	P - ID Gamma Adjustment (Photo - Binary)	Selects the ID gamma curve for dithering. **This adjustment is only effective for the "Service Mode" original type setting.** See "Detailed Descriptions - Image Processing" for details. **Normally do not change the value.**	5: 53 (Coarse Print) **6: 105 (Press Print)**
4-942*		White Line Erase	Selects whether or not white line erase is done (for all original modes except "Service Mode"). *See "Detailed Descriptions - Image Processing" for details.*	**0: Normal** 1: Disable
4-943*		Black Line Erase	Selects the black line erase level (for all original modes except "Service Mode"). This SP is effective only when scanning the original using the ADF *See "Detailed Descriptions - Image Processing" for details.*	**0: Strong** 1: Disable 2: Weak
4-944*		Independent Dot Erase	Selects whether or not independent dot erase is done (for all original modes except "Service Mode"). *See "Detailed Descriptions - Image Processing" for details.*	**0: Normal** 1: Disable
4-947*	1	Positive/Negative MTF Coefficient (Main Scan – Binary)	Selects the MTF coefficient for the positive/negative feature in the main scan direction. *This SP is effective only when the value of SP4-401 is "1".*	0 ~ 15 1 /step **1**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
4-947*	2	Positive/Negative MTF Coefficient (Sub Scan – Binary)	Selects the MTF coefficient for the positive/negative feature in the sub scan direction. *This SP is effective only when the value of SP4-401 is "1".*	0 ~ 15 1 /step **2**
	3	Positive/Negative MTF Strength (Main Scan – Binary)	Selects the MTF strength for the positive/negative feature in the main scan direction. *This SP is effective only when the value of SP4-401 is "1".*	0 ~ 15 1 /step **5**
	4	Positive/Negative MTF Strength (Sub Scan – Binary)	Selects the MTF strength for the positive/negative feature in the sub scan direction. *This SP is effective only when the value of SP4-401 is "1".*	0 ~ 15 1 /step **5**
4-948*	1	Positive/Negative Binary Threshold - MAX	Adjusts the maximum value of the dynamic binary threshold used at the edges of text elements for the positive/negative feature. *This SP is effective when the value of SP4-401 is "1".and "Dynamic Binary" is selected with SP4-922-1.* *See "Detailed Descriptions - Image Processing" for details.*	0 ~ 255 1/step **160**
	2	Positive/Negative Binary Threshold - MIN	Adjusts the minimum value of the dynamic binary threshold used at the edges of text elements for the positive/negative feature. *Same comments as for SP4-948-1.*	0 ~ 255 1/step **96**
	3	Positive/Negative Binary Threshold - Center	Adjusts the threshold in dynamic binary mode for pixels not on edges of text/graphic elements for the positive/negative feature. *Same comments as for SP4-948-1.*	0 ~ 255 1/step **96**
4-950*		Shading Mode Selection	Selects the scanner shading method in ADF mode. **0: Russian (Do the shading every page.)** 1: ADAM (Do the shading at the time specified by SP4-913.) 2: None (This is for the designer's test purposes. Do not select this value.) ***This is for the designer's test purposes. Do not change the value.***	**0**
5-001		All Indicators On	Turns on all indicators on the operation panel. *Press "OK" or the # key to check. Press the (Clear Modes) key to exit this SP mode. The LCD blinks all on and all off every 2 seconds.*	
5-103*		Auto Paper Tray Shift	Selects whether or not auto paper tray shift is done.	0: No **1: Yes**

Service Tables

Mode No.			Function	Settings
Class 1 and 2	Class 3			
5-104*		A3/DLT Double Count	Specifies whether the counter is doubled for A3/11" x 17" paper.	**0: No** 1: Yes
			If "Yes" is selected, the total counter (mechanical counter) and the current user code counter counts up twice when A3/11" x 17" paper is used.	
5-106*		ADS Level Selection	Selects the image density level that is used in ADS mode.	1 ~ 7 1 notch/step **4**
5-113*		Option Counter Type	Selects the optional counter type.	**0: None** 1: Key Counter
			After installing the optional key counter, this SP must be set to "1".	
5-116*		Key Counter Up Timing	Determines whether the total counter counts up at paper feed-in or at paper exit.	**0: Feed In** 1: Exit
5-120*		Opt. Counter Reset Setting	**This SP is for Japan only. Do not change the value.**	0: Yes 1: Stand-by 2: None
5-143		DF 180° Image Rotation	Select whether the image is rotated 180° (upside down) in DF mode.	**0: No** 1: Yes
			Selects "Yes" when making a copy on a letter headed page when feeding from a paper tray.	
5-401*	1	User Code Mode (Copier)	Selects whether the user code feature is enabled in copy mode or not.	**0: No** 1: Yes
			If this value is changed, the user tool setting is also changed.	
	2	User Code Mode (Fax)	Selects whether the user code feature is enabled in fax mode or not.	**0: No** 1: Yes
			If this value is changed, the user tool setting is also changed.	
	3	User Code Mode (Printer)	Selects whether the user code feature is enabled in printer mode or not.	**0: No** 1: Yes
			If this value is changed, the user tool setting is also changed.	
5-501*	1	PM Alarm Interval	Sets the PM interval.	1 ~ 255 1k copies /step **120k copies**
			The value stored in this SP is used when the value of SP5-501-2 and/or -3 is "1".	
	2	PM Alarm Mode (Prints)	Selects whether the PM alarm for the number of prints/copies is enabled or not	0: No **1: Yes**
			If this is "1", the PM alarm function is enabled.	
	3	PM Alarm Mode (Original)	**This SP is for Japan only. Do not change the value.** Selects whether the PM alarm for the number of scans is enabled or not	**0: No** 1: Yes
			If this is "1", the PM alarm function is enabled.	

Mode No.			Function	Settings
Class 1 and 2	Class 3			
5-504*		Jam Alarm Setting	**This SP is for Japan only. Do not change the value.**	0 ~ 255 100 copies /step **40**
5-505*		Error Alarm Setting	**This SP is for Japan only. Do not change the value.**	0 ~ 255 100 copies /step **10**
5-507*	1	Consumable Alarm (Paper)	**This SP is for Japan only. Do not change the value.**	**0: No** 1: Yes
	2	Consumable Alarm (Staple)		**0: No** 1: Yes
	3	Consumable Alarm (Toner)		**0: No** 1: Yes
5-508*	1	CE Call (Jam Level 1)	**This SP is for Japan only. Do not change the value.**	
	2	CE Call (Jam Level 2)		
	3	CE Call (Door Open)		
5-801		Memory All Clear	Resets all software counters. Also, returns all modes and adjustments to the default settings (except for the machine serial number, SP5-811). After selecting "1", press the "Original Type" key and the # key at the same time to clear the memory. If the reset was successful, the beeper will sound 5 times. If it failed, the beeper will sound only twice. See the "Memory All Clear" section for how to use this SP mode correctly. ***Normally, this SP mode should not be used.*** *It is used only after replacing the NVRAM or when the copier malfunctions due to a damaged NVRAM.*	**0: No** 1: Yes
5-802		Free Run	Performs a free run for both the scanner and the printer. *After selecting "1", press "OK" or the # key twice to start this feature. Press the Clear/Stop key to stop.*	**0: No** 1: Yes
5-803		Input Check	Displays signals received from sensors and switches. *Press the Clear Modes key to exit the program. See the "Input Check" section for details.*	
5-804		Output Check	Turns on electrical components individually for test purposes. *See the "Output Check" section for details.*	

Mode No.			Function	Settings
Class 1 and 2	Class 3			
5-807*		Display Language Group	**This SP is effective only for the European version.** Selects the display language group. See "Display language" for details. *The actual display language can be selected using SP5-808.*	**0: Standard** 1: Option 1 2: Option 2
5-808*		Display Language	Selects the display language. See "Display language" for details. *For the European version, the display languages are divided into the language groups of SP5-807.*	
5-809*		mm/inch Selection	Selects whether mm or inches are used in the display.	**Eur./Asia model** **0: mm** 1: inch **American model** **0: inch** 1: mm
5-810		SC Code Reset	Resets all level A service call conditions, such as fusing errors. After selecting "1", press the "Original Type" key and the # key at the same time to reset the SC codes. If the reset was successful, the beeper will sound 5 times. If it failed, the beeper will sound only twice. After performing this SP mode, turn the machine's main switch off and on. *See "Troubleshooting - Service Call Conditions" for how to use this mode.*	**0: No** 1: Yes
5-811		Serial Number Input	Use to input the machine serial number. (This is normally done at the factory.) *This serial number will be printed on the SMC report. See the "Serial Number Input" section for details.*	
5-812*	1	Service Telephone Number (Telephone)	Use this to input the telephone number of the service representative (this is displayed when a service call condition occurs). *Press the * key if you need to input a pause (–). Press the Clear/Stop key to delete the telephone number.*	
	2	Service Telephone Number (Facsimile)	Use this to input the fax number which will be printed on the user counter report. *Press the * key if you need to input a pause (–). Press the Clear/Stop key to delete the telephone number.*	
5-816*		CSS Function	**This SP is for Japan only. Do not change the value.**	**0: No** 1: Yes

Mode No.			Function	Settings
Class 1 and 2	Class 3			
5-817	1	CE Start/Finish Call (CE Start Call)	**This SP is for Japan only. Do not change the value.**	**0: No** 1: Yes
	2	CE Start/Finish Call (CE Finish Call)		
5-821		CSS-PI Device Code	**This SP is for Japan only. Do not change the value.**	**0: No** 1: Yes
5-824		NVRAM Data Upload	Uploads SP and UP mode data (except for counters and the serial number) from the flash memory on the BICU board to a flash memory card. *This SP can be used when a flash memory card is plugged into the machine. See the "NVRAM Data Upload" section for details.*	**0: No** 1: Yes
5-825		NVRAM Data Download	Downloads SP mode data from a flash memory card to the flash memory on the BICU board. *This SP can be used when a flash memory card is plugged into the machine. See the "NVRAM Data Download" section for details.*	**0: No** 1: Yes
5-826		Program Upload	Uploads the system program from the flash memory on the BICU board to a flash memory card. *This SP can be used when a flash memory card is plugged into the machine. See the "Program Upload" section for details.*	**0: No** 1: Yes
5-827		Program Download	Downloads the system program from a flash memory card to the flash memory on the BICU board. *This SP can be used when a flash memory card is plugged into the machine. See the "Program Download" section for details.*	**0: No** 1: Yes
5-901		Printer Free Run	Performs a printer free run. *After selecting "1", press "OK" or the # key twice to start this feature. Press the C/⊘ (Clear/Stop) key to stop.*	**0: No** 1: Yes
5-902		Test Pattern Print	Prints a test pattern. *See the "Test Pattern Printing" section for how to print a test pattern.* *Change to the copy mode display by pressing the ⏎ (Interrupt) key, then print out the test pattern.*	
5-903*		LCD Contrast Adjustment	Adjusts the contrast of the LCD on the operation panel.	0 ~ 7 1 /step **3**
5-904*		Auto Off Timer Setting	Adjusts the auto off mode timer (also used for night mode if a fax or printer option is installed). *If this value is changed, the user tool setting is also changed.*	1 ~ 240 1 min/step **60 min**
5-905*		CSS 25 Hours Off Detection	**This SP is for Japan only. Do not change the value.**	

Mode No.			Function	Settings
Class 1 and 2	Class 3			
5-906*	1	Exhaust Fan Control Timer (Stand-by/Night Mode)	Inputs the fan control time for stand-by and night mode. *The fan slows down after this time has passed since the end of a job or enters energy saver mode.* *The fan stops after this time has passed since any of the following conditions occurred:* • *After entering night mode (fax/printer installed)* • *After entering an SC condition.*	30 ~ 120 1 s /step **30 s**
	2	Exhaust Fan Control Timer (Low Power Mode)	Inputs the fan control timer for low power mode. *The fan stops after this time has passed since the machine entered low power mode.*	0 ~ 180 1 s /step **180 s**
5-907		Plug & Play Setting	Selects the brand name and the production name for the Plug and Play function of Windows 95/98. These are registered in the NVRAM. If the NVRAM is defective, these names should be registered again. *Set this SP to 1. Then press down the "Original Type" key and the "OK" key or # key at the same time to register the setting. If the setting was successful, the beeper will sound 5 times. If it failed, the beeper will sound only twice.* *If the setting is completed, a "*" mark will be displayed before the selection.*	
5-908*		LCT Paper Size	Selects the paper size for the LCT. *Use this SP after changing the paper size in the optional LCT (i.e., after changing the side plate position for the LCT).*	**0: A4 (Eur./Asia model)** **1: LT (American model)**
5-909*		24V Down Setting (Night Mode)	Selects whether or not the 24V supplies are cut while night mode is active. *Set this to '1' if the customer wishes to check the machine conditions displayed on the operation panel LED (such as paper end) while night mode is active.*	**0: 24V down** 1: 24V supplied
5-911*		APS A4/LT Sideways Priority	Specifies whether the machine selects LT sideways or lengthwise paper if the original is A4. In inch models, if "Yes" is selected, LT sideways or lengthwise is selected automatically when the APS sensors detect an A4 sideways or lengthwise original. In mm models, if "Yes" is selected, A4 sideways or lengthwise is selected automatically when the APS sensors detect an LT sideways or lengthwise original.	**0: No** 1: Yes

Mode No.			Function	Settings
Class 1 and 2	Class 3			
5-912*	1	PCU Alarm Setting (Display)	Selects whether the PCU alarm message (Change Photoconductor Unit) blinks when the PCU alarm interval expires. *When installing the machine, if the customer requires that the PCU alarm message blink, select "1". If set to "0", there will be no message.*	0: No **1: Yes**
	2	PCU Alarm Setting (Interval)	Sets the PCU alarm interval. *When the machine reaches this value, the PCU alarm will be displayed on the LCD to inform the user. Only used if SP5-912-1 is at "1".*	1~ 255 1k copies/step **60k copies**
5-913		UP Mode Data Reset	Resets the user tool data. *Except for the user codes, key operator code, and key operator printer counter. Set this SP to 1. Then press down the "Original Type" key and the "OK" key or # key at the same time to reset the data. If the reset was successful, the beeper will sound 5 times. If it failed, the beeper will sound only twice.*	**0: No** 1: Yes
5-914*		Printer Counter Display	Selects whether the printer counter is displayed in the LCD or not. *If this is "0", it does not display or print out in the counter print out.*	**0: No** 1: Yes
5-916		Language UK/TW Priority	**Asia and Taiwan versions only.** Select the default language of SP5-808. *This value will not reset when Memory All Clear (SP5-801) is done.*	**0: UK (Asia version)** **1: TW (Taiwan version)**
5-925		Serial Number Display	Displays the serial number.	
5-930*		Fax Forwarding Mode	Selects whether the fax mode key is accepted when an SC has occurred. *When an SC occurs while there are received fax messages in the SAF memory, change the value to "1". Then access facsimile mode. Then forward the incoming data to another fax machine by using the fax mode bit switches.*	**0: No** 1: Yes
5-932		BICU Software Upload (for designer)	**This SP is for designers only. Do not perform this SP.**	**0: No** 1: Yes
5-933		BICU Software Download (for designer)	**This SP is for designers only. Do not perform this SP.**	**0: No** 1: Yes
5-940*		Image Rotation Mode	Selects whether the image can be rotated or not.	**0: Enabled** 1: Disabled
5-941*		Duplex Blank Page	Selects whether the blank page is made on the front side or back side when duplex copy mode is selected.	**0: Back Side** 1: Front Side

Mode No.			Function	Settings
Class 1 and 2	Class 3			
5-944*		APS Mode Setting	Selects whether APS mode is selected as the power-up default.	0: Disabled **1: Enabled**
5-946*		Auto Off Disabling	Selects whether auto off is disabled when there are sheets in the exit tray. *If the LED does not light when paper enters the tray, the user cannot see easily if paper is there or not.* *1: For machines with no fax/printer option, the machine does not do auto off (with the fax/printer option, the machine will go to night mode but the LED still works).* 0: *For machines with a fax/printer option, the machine does not light the exit tray LED even in night mode.*	**0: No** 1: Yes
5-950*		By-pass LG Size Detection	**For American models only** Selects whether the machine can detect LG paper or LT paper in the by-pass tray.	0: No **1: Yes**
5-951*		Inter Leaves Count Setting	Selects the interleave count when interleave mode is selected with User Tools (System Settings - Print Priority). In interleave mode, the machine will print 5 pages of one job, then 5 pages of the other job, and so on.	1 ~ 20 1 pages/step **5 pages**
5-952*		Paper Type Reset (By-pass Tray)	Selects the paper type for the by-pass tray at power-up or after pressing the ⎆ key. *If this is "2", the previously used paper type will be selected.*	**0: Thick** 1: Plain 2: Hold
5-991		VRAM Data Download	This is for the designer's test purposes. ***Do not change the value.***	**0: No** 1: Yes
5-992		SMC Printing	Prints the machine status history data list. See the "SMC data Lists" section for how to print the lists. *"5" is for facsimile transmission.*	1: SP 2: UP 3: Log 4: All 5: Big Font
6-006*	1	ADF Registration (Side-to-Side)	Adjusts the side-to-side registration in the ADF mode. *Use the # key to toggle between + and - before entering the value. See "Replacement and Adjustment - Copy Adjustment" for details.*	–7.0 ~ +9.5 0.1 mm/step **0.0 mm**
	2	ADF Registration (Leading Edge)	Adjusts the leading edge registration in the ADF mode. *Use the # key to toggle between + and - before entering the value. See "Replacement and Adjustment - Copy Adjustment" for details.*	–5.0 ~ +5.0 0.1 mm/step **0.0 mm**

Mode No.			Function	Settings
Class 1 and 2	Class 3			
6-006*	3	ADF Registration (Trailing Edge Erase)	Adjusts the trailing edge erase margin in the ADF mode. *Use the * key to toggle between + and - before entering the value. See "Replacement and Adjustment - Copy Adjustment" for details.*	–3.0 ~ +3.0 0.1 mm/step **-1.0 mm**
	4	ADF Registration (Side-to-Side/Rear)	Adjusts the side-to-side registration on the rear side of the original in the ADF mode. *Use the * key to toggle between + and - before entering the value. See "Replacement and Adjustment - Copy Adjustment" for details.*	–7.0 ~ +9.5 0.5 mm/step **0.0 mm**
6-007*		ADF Sub-scan Magnification	Adjusts the magnification in the sub-scan direction for ADF mode. *Use the * key to toggle between + and - before entering the value. See "Replacement and Adjustment - Copy Adjustment" for details.*	–0.9 ~ +0.9 0.1%/step **0.0%**
6-009		ADF Free Run	Performs an ADF free run in duplex scanning mode. *After selecting "1", press "OK" or the # key twice then set the paper to start this feature. Press the Clear/Stop key to stop.*	**0: No** 1: Yes
6-010*		Stamp Position Adjustment	Adjusts the stamp position in the sub-scan direction in fax mode.	–10 ~ +10 1 mm/step **0 mm**
6-901		ADF APS Data Display	Displays the status of the original size sensors in the ADF. *See the "DF APS Original Sensor Output Display" section.*	
6-902*		ADF Scanning Method	Selects the original scanning method in ADF mode. ***Do not change the setting.***	**0: Doc (original)** 1: Mag (copy paper size + magnification)
6-905*		ARDF Skew Correction	Selects whether the skew correction is done or not when the ARDF feeds the rear side of the original.	0: No **1: Yes**
6-906*		ARDF Original Curl Adjustment	Adjusts the amount of original buckle at the ARDF registration roller when the ARDF feeds the rear side of the original. *This SP mode is only effective when SP 6-905 is at "1".*	-20 ~ +20 1 mm/step **0 mm**
6-910		ADF/Printer Free Run	**This SP is for the designers only do not perform this SP mode.**	**0: No** 1: Yes

Mode No.			Function	Settings
Class 1 and 2	Class 3			
6-911*		Binding Hole Range	Selects the range for which binding holes in originals are ignored. If set at "0", this function is disabled. *An original jam may occur when an original with binding holes is fed, because these holes are detected by the sensors. Use this SP to avoid this problem. For example, when this value is set to "12 mm", this machine ignores binding holes within 12 mm of the trailing edge of the original.*	0 ~ 20 1 mm/step **12 mm**
7-001*		Total Operation Time	Displays the total operation time (total drum rotation time).	
7-002*	1	Total Original Counter (All Modes)	Displays the total number of scanned originals (all modes).	
	2	Total Original Counter (Copier)	Displays the total number of scanned originals (copy mode only).	
	3	Total Original Counter (Fax)	Displays the total number of scanned originals (fax mode only).	
7-003*	1	Total Print Counter (All Modes)	Displays the total number of prints (all modes).	
	2	Total Print Counter (Copier)	Displays the total number of prints (copier mode).	
	3	Total Print Counter (Fax)	Displays the total number of prints (fax mode).	
	4	Total Print Counter (Printer)	Displays the total number of prints (printer mode).	
7-004*		CE Counter Setting	**This SP mode is effective only when the CSS board is installed.** **Do not change the value.**	
7-101*	1	Copy Counter - Paper Size (A3)	Displays the total number of copies by paper size.	
	2	Copy Counter - Paper Size (B4)		
	3	Copy Counter - Paper Size (A4)		
	4	Copy Counter - Paper Size (B5)		
	5	Copy Counter - Paper Size (DLT)		
	6	Copy Counter - Paper Size (LG)		
	7	Copy Counter - Paper Size (LT)		
	8	Copy Counter - Paper Size (HLT)		
	9	Copy Counter - Paper Size (Others)		
7-201*		Total Scan Counter	Displays the total number of scanned originals.	
7-204*	1	Copy Counter - Paper Tray (1st)	Displays the total number of copies fed from each paper feed station.	

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-204*	2	Copy Counter - Paper Tray (2nd)	Displays the total number of copies fed from each paper feed station.	
	3	Copy Counter - Paper Tray (3rd)		
	4	Copy Counter - Paper Tray (4th)		
	5	Copy Counter - Paper Tray (By-pass)		
	6	Copy Counter - Paper Tray (Duplex)		
7-205*		Total ADF Counter	Displays the total number of originals fed by the ADF.	
7-301*	1	Copy Counter - Mag. (25%~49%)	Displays the total number of copies by reproduction ratio and magnification.	
	2	Copy Counter - Mag. (50%~99%)		
	3	Copy Counter - Mag. (Full Size)		
	4	Copy Counter - Mag. (101%~200%)		
	5	Copy Counter - Mag. (201%~400%)		
	6	Copy Counter - Mag. (Direct Mag.)		
	7	Copy Counter - Mag. (Direct Size Mag.)		
	8	Copy Counter - Mag. (Size Mag.)		
	9	Copy Counter - Mag. (Fiex Mag.)		
7-303*	1	Copy Counter – Image Edit (All Modes)	Displays the total number of copies by image editing mode. **No.2, 4, 5, 7, and 9 are for the Japanese version only.**	
	2	Copy Counter – Image Edit (Mirror)		
	3	Copy Counter – Image Edit (Posi./Nega.)		
	4	Copy Counter – Image Edit (Shard)		
	5	Copy Counter – Image Edit (Outline)		
	6	Copy Counter – Image Edit (Image Repeat)		
	7	Copy Counter – Image Edit (Double Copy)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-303*	8	Copy Counter – Image Edit (Overlay)	Displays the total number of copies by image editing mode. **No.2, 4, 5, 7, and 9 are for the Japanese version only.**	
	9	Copy Counter – Image Edit (Shard Pattern)		
7-304*	1	Copy Counter - Copy Mode (Text)	Displays the total number of copies by copy mode.	
	2	Copy Counter - Copy Mode (Text/Photo)		
	3	Copy Counter - Copy Mode (Photo)		
	4	Copy Counter - Copy Mode (Duplex)		
	5	Copy Counter - Copy Mode (Double Sided Original)		
	6	Copy Counter - Copy Mode (Combine)		
	7	Copy Counter - Copy Mode (Series Copy)		
	8	Copy Counter - Copy Mode (Erase)		
	9	Copy Counter - Copy Mode (Preset Stamp)		
	10	Copy Counter - Copy Mode (Page Number)		
	11	Copy Counter - Copy Mode (Cover Sheet)		
	12	Copy Counter - Copy Mode (OHP Slip Sheet)		
	13	Copy Counter - Copy Mode (Sort)		
	14	Copy Counter - Copy Mode (Staple)		
	15	Copy Counter - Copy Mode (ADF)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-305*	1	Copy Counter - Copy Q'ty (1 to 1)	Displays the total number of series copies.	
	2	Copy Counter - Copy Q'ty (1 to 2 ~ 5)		
	3	Copy Counter - Copy Q'ty (1 to 6 ~ 10)		
	4	Copy Counter - Copy Q'ty (1 to 11 ~ 20)		
	5	Copy Counter - Copy Q'ty (1 to 21 ~ 99)		
7-401*		Total SC Counter	Displays the total number of service calls that have occurred.	
7-402*		Each SC Code Counter	Displays the total number of each service call that has occurred.	**0: No** 1: Yes
7-501*		Total Jam Counter	Displays the total number of jams.	
7-502*		Total Paper Jam Counter	Displays the total number of paper jams.	
7-503*		Total Original Jam Counter	Displays the total number of original jams.	
7-504*	1	Total Jams by Location (A Jam)	Displays the total number of paper jams by location.	
	2	Total Jams by Location (B Jam)		
	3	Total Jams by Location (C Jam)		
	4	Total Jams by Location (D Jam)		
	5	Total Jams by Location (R Jam)		
	6	Total Jams by Location (Y Jam)		
	7	Total Jams by Location (Z Jam)		
	8	Total Jams by Location (1st)		
	9	Total Jams by Location (2nd)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-504*	10	Total Jams by Location (3rd)	Displays the total number of paper jams by location.	
	11	Total Jams by Location (4 h)		
	12	Total Jams by Location (By-pass)		
	13	Total Jams by Location (Duplex Unit)		
7-801	1	ROM Version/Connection (Main Control)	Displays the ROM version. **NOTE: SP7-801-5 and 14 are used only for the Japanese version.**	
	2	ROM Version/Connection (BiCU)		
	3	ROM Version/Connection (FAX Control)		
	4	ROM Version/Connection (Printer Control)		
	5	ROM Version/Connection (ANITA)		
	6	ROM Version/Connection (Scanner)		
	7	ROM Version/Connection (Duplex)		
	8	ROM Version/Connection (ADF)		
	9	ROM Version/Connection (Finisher)		
	10	ROM Version/Connection (PI)		
	11	ROM Version/Connection (Memory)		
	12	ROM Version/Connection (1 Bin Tray)		
	13	ROM Version/Connection (Paper Tray Unit)		

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-801	14	ROM Version/Connection (Image Edit)	Displays the ROM version. **NOTE: SP7-801-5 and 14 are used only for the Japanese version.**	
7-803*		PM Counter Display	Displays the PM counter since the last PM.	
7-804		PM Counter Resets	Resets the PM counter. *After selecting "1", press down the "Original Type" key and the "OK" or # key at the same time to reset the counters. If the reset was successful, the beeper will sound 5 times. If it failed, the beeper will sound only twice.*	**0: No** 1: Yes
7-807		SC/Jam Counter Reset	Resets the SC and jam counters. *After selecting "1", press down the "Original Type" key and the "OK" or # key at the same time to reset the counters. If the reset was successful, the beeper will sound 5 times. If it failed, the beeper will sound only twice.*	**0: No** 1: Yes
7-808		Resets Counters	Resets the counters except for the total counter (SP7-003) and the timer counter (SP7-991). *After selecting "1", press down the "Original Type" key and the "OK" or # key at the same time to reset the counters. If the reset was successful, the beeper will sound 5 times. If it failed, the beeper will sound only twice.*	**0: No** 1: Yes
7-810		Key Operator Code Reset	Resets the key operator code. *After selecting "1", press down the "Original Type" key and the "OK" or # key at the same time to reset the counters. If the reset was successful, the beeper will sound 5 times. If it failed, the beeper will sound only twice.*	**0: No** 1: Yes
7-825		Total Counter Reset	Resets the electrical total counter. *Usually, this SP mode is done at installation. This SP mode is effective only once, when the counter has a negative value.* *After selecting "1", press down the "Original Type" key and the "OK" or # key at the same time to reset the counters. If the reset was successful, the beeper will sound 5 times. If it failed, the beeper will sound only twice.*	**0: No** 1: Yes
7-901*		SC History Display	Displays the last twenty SC codes that have occurred.	**0: No** 1: Yes

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-902		SC History Clear	Resets the SC history. *After selecting "1", press down the "Original Type" key and the "OK" or # key at the same time to reset the counters. If the reset was successful, the beeper will sound 5 times. If it failed, the beeper will sound only twice.*	**0: No** 1: Yes
7-903*		Copy Jam History Display	Displays the copy jams that have occurred.	**0: No** 1: Yes
7-904		Copy Jam History Clear	Resets the copy jam history. *After selecting "1", press down the "Original Type" key and the "OK" or # key at the same time to reset the counters. If the reset was successful, the beeper will sound 5 times. If it failed, the beeper will sound only twice.*	**0: No** 1: Yes
7-905		Orig. Jam History Display	Displays the original jams that have occurred.	**0: No** 1: Yes
7-906		Orig. Jam History Clear	Resets the original jam history. *After selecting "1", press down the "Original Type" key and the "OK" or # key at the same time to reset the counters. If the reset was successful, the beeper will sound 5 times. If it failed, the beeper will sound only twice.*	**0: No** 1: Yes
7-907		Timer Counter Reset	Resets the timer counter (SP7-991). *After selecting "1", press down the "Original Type" key and the "OK" or # key at the same time to reset the counters. If the reset was successful, the beeper will sound 5 times. If it failed, the beeper will sound only twice.*	**0: No** 1: Yes
7-908*		PCU Counter Display	Displays the value of the PCU counter (number of copies since the last PCU change).	
7-909		PCU Counter Reset	Resets the PCU counter. *After selecting "1", press down the "Original Type" key and the "OK" or # key at the same time to reset the counters. If the reset was successful, the beeper will sound 5 times. If it failed, the beeper will sound only twice*	**0: No** 1: Yes
7-910		Jam Code Display	Displays the jam codes. The order of the jam display is as follows. • Newest paper jam code • Newest original jam code • Paper jam codes (in numerical order) • Original jam codes (in numerical order)	

Mode No.			Function	Settings
Class 1 and 2	Class 3			
7-911		ID Sensor Error Counter Display	Displays the number of ID sensor errors that have occurred.	
7-912		ID Sensor Error Counter Reset	Resets the ID sensor error counter.	**0: No** 1: Yes
7-991*		Timer Counter Display	Displays the total time that the main switch has been turned on.	

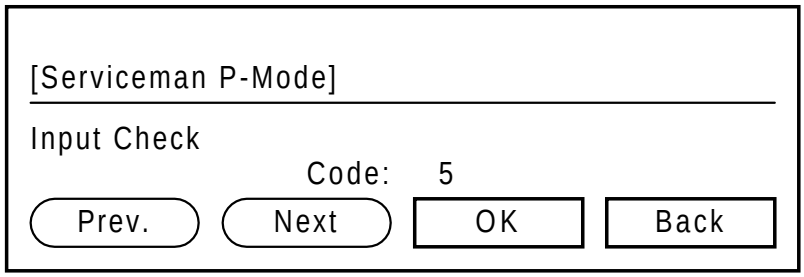
4.2.3 TEST PATTERN PRINTING (SP4-417 AND SP5-902)

1. Input the level 3 number for the test pattern you need.
2. Press the (Interrupt) key on the display to access the copy mode display.
3. Select the required copy features such as paper size, image density, and reproduction ratio.
4. Press the key to print the test pattern.
5. After checking the test pattern, exit copy mode by pressing the (Interrupt) key again.
6. Exit SP mode.

No.	Test Pattern (SP4-417)
0	No Print
1	Vertical Lines (single dot)
2	Horizontal Lines (single dot)
3	Vertical Lines (double dots)
4	Horizontal Lines (double dots)
5	Alternating Dot Pattern
6	Grid Pattern (single dot)
7	Vertical Stripes
8	Grayscales (Horizontal)
9	Grayscales (Vertical)
10	ID Patch
11	Cross Pattern
12	Argyle Pattern
13	Trimming Area
14	Vertical Lines (double dots) - SBU
15	Grid Pattern (single dot) - SBU
16	16 Grayscales - SBU

No.	Test Pattern (SP5-902)
0	No Print
1	Vertical Lines (single dot)
2	Horizontal Lines (single dot)
3	Vertical Lines (double dots)
4	Horizontal Lines (double dots)
5	Grid Pattern (single dot)
6	Grid Pattern (double dots)
7	Alternating Dot Pattern
8	Full Dot Pattern
9	Black Band
10	Trimming Area
11	Argyle Pattern
12	Grayscales (Horizontal)
13	Grayscales (Vertical)
14	Grayscales (Vert./Hor.)
15	Grayscales (Vert./Hor. Overlay)
16	Grayscales with white lines (Horizontal)
17	Grayscales with white lines (Vertical)
18	Grayscales with white lines (Vert./Hor.)

4.2.4 INPUT CHECK (SP5-803)



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1. Access SP mode 5-803.
2. Select the number that will access the switch or sensor you wish to check (see the table below).
3. Check the status of the sensor or switch.
4. If you wish to check the signal during a copy cycle, select the required copy modes, then press the Start key. After that, re-enter the SP mode to monitor the signal.
5. The LCD panel will display “00H” or “01H”. The meaning of the display is as follows.

Input Check Table

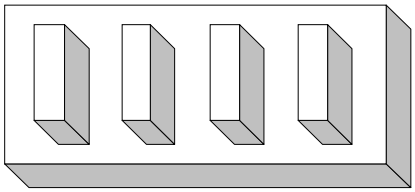
Number	Description	Reading	
		00H	01H
0	Not used		
1	Front cover safety switch	Closed	Opened
2	Front cover safety switch – LD5 V	Closed	Opened
3	Right cover switch	Closed	Opened
4	Right lower cover switch	Closed	Opened
5	Tray Cover (optional paper tray unit)	Closed	Opened
6	Duplex unit open switch (Optional duplex unit)	Closed	Opened
7	Right upper cover switch	Closed	Opened
8	Right guide switch (Optional bridge unit)	Closed	Opened
9	Left guide switch (Optional bridge unit)	Closed	Opened
10	Not used		
11	Paper overflow sensor	Paper not detected	Paper detected
12 ~ 15	Not used		
16	Upper relay sensor	Paper not detected	Paper detected
17	Lower relay sensor	Paper not detected	Paper detected
18	Vertical transport sensor (Optional paper tray unit)	Paper not detected	Paper detected

Number	Description	Reading	
		00H	01H
19	Registration sensor	Paper not detected	Paper detected
20	Paper exit sensor	Paper not detected	Paper detected
21	Exit sensor (Optional interchange unit)	Paper not detected	Paper detected
22	Duplex entrance sensor (Optional duplex unit)	Paper not detected	Paper detected
23	Duplex exit sensor (Optional Duplex unit)	Paper not detected	Paper detected
24	Relay sensor (Optional bridge unit)	Paper not detected	Paper detected
25	Tray exit sensor (Optional bridge unit)	Paper not detected	Paper detected
26	Paper end sensor (optional bypass tray)	Paper not detected	Paper detected
27	Paper size sensor sensor (optional bypass tray)	See Table 2	
28 ~ 29	Not used		
30	Special paper switch	Off	On
31	Upper paper end sensor	Paper not detected	Paper detected
32	Lower paper end sensor	Paper not detected	Paper detected
33	Upper paper size switch	See Table 1	
34	Lower paper size switch	See Table 1	
35	1st paper height sensors	See Table 3	
36	2nd paper height sensors	See Table 3	
37	Upper paper end sensor (or right tray end sensor for the LCT) (Optional paper tray unit or LCT)	Paper not detected	Paper detected
38	Lower paper end sensor (Optional paper tray unit)	Paper not detected	Paper detected
39	Upper paper size switch (Optional paper tray unit or LCT)	See Table 1 (for paper tray unit) 01: A4, 02: LT (for LCT – there is no sensor)	
40	Lower paper size switch (Optional paper tray unit)	See Table 1	
41	Upper paper height sensor (Optional paper tray unit or LCT)	See Table 3	
42	Lower paper height sensor (Optional paper tray unit)	See Table 3	
43	Upper paper lift (limit) sensor (Optional paper tray unit or LCT)	Paper not at correct height	Paper at correct height
44	Lower limit sensor (Optional LCT)	Tray is not down	Tray is down
45	Rear fence H.P sensor (Optional LCT)	Not home position	At home position
46	Rear fence return sensor (Optional LCT)	Not return position	At return position
47	Side fence closed sensor (Optional LCT)	Not detected	Detected

Number	Description	Reading	
		00H	01H
48	Side fence open sensor (Optional LCT)	Not detected	Detected
49	Left tray paper end sensor (Optional LCT)	Paper not detected	Paper detected
50	Tray set switch(Optional LCT)	Off	On
51	Paper sensor (Optional 1 Bin tray)	Paper not detected	Paper detected
52	Not used		
53	PCU set signal (a shorted connection in the ID sensor cable)	Not set	Set
54	New PCU detect switch	Used PCU	New PCU
55	Paper tray unit type (Optional paper tray unit)	See Table 4	
56	Paper tray unit installed	Not installed	Installed
57	1-bin sorter installed	Not installed	Installed
58	BICU installed	Not installed	Installed
59	Bridge unit installed	Not installed	Installed
60	Shift tray unit installed	Not installed	Installed
61	By-pass tray installed	Not installed	Installed
62	Duplex unit installed	Not installed	Installed
63	Fusing unit installed	Not installed	Installed
64	Interchange unit installed	Not installed	Installed
65	Finisher installed	Not installed	Installed
66	Not used		
67	1st paper lift sensor	Paper not at correct height	Paper at correct height
68	2nd paper lift sensor	Paper not at correct height	Paper at correct height
69	Lower paper lift sensor (Optional paper tray unit)	Paper not at correct height	Paper at correct height
70	Not used		
71	Main motor lock	Off	On
72	Polygonal mirror motor lock	Off	On
73	Tray motor lock (Optional paper tray unit)	Off	On
74	Exhaust fan motor lock	Off	On
76	Total (mechanical) counter installed	Not installed	Installed
77	Not used		
78	Key counter installed (Optional key counter)	Not installed	Installed
79 ~ 80	Not used		
81	Laser synchronization signal	Not detected	Detected
82	LD error	No error	Error
83 ~ 89	Not used		
90	DF position sensor (Optional ADF)	Closed	Opened

Number	Description	Reading	
		00H	01H
91	Feed cover open sensor (Optional ADF)	Closed	Opened
92	Original set sensor (Optional ADF)	Paper not detected	Paper detected
93	Registration sensor (Optional ADF)	Paper not detected	Paper detected
94	Original trailing edge sensor (Optional ADF)	Paper not detected	Paper detected
95	Original exit sensor (Optional ADF)	Paper not detected	Paper detected
96	Original reverse sensor (Optional ADF)	Paper not detected	Paper detected
97 ~ 98	Not used		
99	Platen cover sensor	Closed	Opened

Table 1: Paper Size Switch (Main Frame)



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Number	SW 1	SW 2	SW 3	SW 4	SP Value	Paper Size
43, 34, 39, 40	0	0	0	0	00H	—
	0	0	1	0	04H	A4 Sideways
	0	0	1	1	0CH	A4 Lengthwise
	0	1	0	1	0AH	11" x 17"
	0	1	1	1	0EH	11" x 8 1/2"
	1	0	0	0	01H	8 1/2" x 11"
	1	0	1	0	05H	* (Asterisk)
	1	1	0	0	03H	8 1/2" x 14"
	1	1	1	1	0FH	A3

1: Pushed

Table 2: By-pass Paper Size Sensor

Number	SP Value	Paper Size	
		mm	inches
27	01H	A3	11" x 17"
	03H	—	11" x 17"
	02H	A4 Lengthwise	8 1/2" x 11"
	06H	8" x 13"	—
	04H	A5 Lengthwise	5 1/2" x 8 1/2"
	0CH	—	—
	08H	—	—

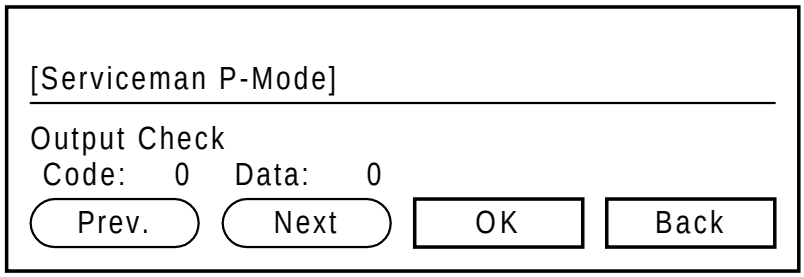
Table 3: Paper Height Sensors

Number	SP Value	Paper Amount
35, 36, 41, 42	00H	100%
	01H	70 ~ 75%
	02H	Near-end
	03H	25 ~ 30%

Table 4: Paper Tray Unit Set Sensor

Number	SP Value	Unit Installed
55	00H	None
	10H	LCT
	20H	Paper tray unit (2 trays)

4.2.5 OUTPUT CHECK (SP5-804)



A250M502.WMF

CAUTION: To prevent mechanical or electrical damage, do not keep an electrical component on for a long time.

1. Access SP mode 5-804.
2. Select the SP number that corresponds to the component you wish to check (see the table below), then press "OK" or the # key.
3. Press "1", then press "OK" or the # key to check that component.
4. To interrupt the test, exit the SP mode.
5. If you wish to check another component, re-enter the SP mode.

Output Check Table

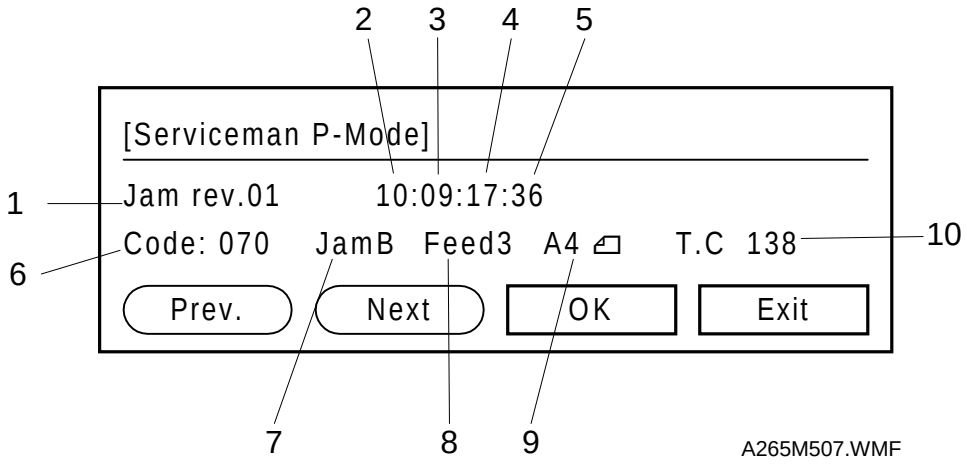
NOTE: Pull out the tray before performing the output checks from 29 to 32.

Number	Description
0	Not used
1	Main motor (forward)
2	Main motor (Reverse) **Do not use**
3	Registration clutch
4	Not used
5	Toner supply motor
6	Not used
7 ~ 8	Not used
9	Exhaust fan (High Speed)
10	Exhaust fan (Low Speed)
11	Not used
12	By-pass feed clutch
13	Upper paper feed clutch
14	Lower paper feed clutch
15	Upper paper lift motor (Up)
16	Upper paper lift motor (Down)
17	Lower paper lift motor (Up)
18	Lower paper lift motor (Down)

Number	Description
19	Lower paper lift motor (Up) (Optional paper tray unit)
20	Lower paper lift motor (Down) (Optional paper tray unit)
21	Upper relay clutch
22	Lower relay clutch
23	Relay clutch (Optional paper tray unit)
24 ~ 25	Not used
26	Upper paper feed clutch (Optional paper tray unit)
27	Lower paper feed clutch (Optional paper tray unit)
28	Tray motor (Optional paper tray unit)
29	Upper Paper lift motor (Up) (Optional paper tray unit or LCT)
30	Rear fence motor (forward) (Optional LCT)
31	Upper paper lift motor (Down) (Optional paper tray unit or LCT)
32	Rear fence motor (reverse (Optional LCT)
33	Side fence solenoid (Optional LCT)
34	Shift tray motor (Optional shift tray)
35	Not used
36	Exit junction gate (Optional interchange unit)
37	Duplex junction gate (Optional interchange unit)
38 ~ 39	Not used
40	Duplex inverter motor (Reverse) (Optional duplex unit)
41	Duplex inverter motor (Forward) (Optional duplex unit)
42	Duplex transport motor (Optional duplex unit)
43	Inverter gate solenoid (Optional duplex unit)
44	Not used
45	Bridge cooling fan motor (Optional bridge unit)
46	Bridge unit drive motor (Optional bridge unit)
47	Junction gate solenoid (Optional bridge unit)
48 ~ 49	Not used
50	1-bin tray LED
51	Polygonal mirror motor
52	Polygonal mirror motor and laser diode
53	Laser diode - **Do not use**
54	Junction gate solenoid (Optional 1-bin Sorter)
54 ~ 79	Not used
80	Duplex unit free run (without paper)
81	Duplex unit free run (with paper)
82 ~ 89	Not used
90	DF transport motor (Optional ADF)
91	DF feed motor (Optional ADF)
92	DF feed clutch (Optional ADF)
93	DF pick-up solenoid (Optional ADF)
94	Stamp solenoid (Optional ADF)
95	DF junction gate solenoid (Optional ADF)
96 ~ 99	Not used

4.2.6 COPY JAM HISTORY DISPLAY (SP7-903)

After entering the SP mode, select “1” and press the “OK” or # key. The LCD panel will display the following message.



1. Jam history number
2. Main motor operating time: Date
3. Hour
4. Minute
5. Second
6. Jam code (see the table below)
7. Jam location
8. Paper feed station
9. Paper size
10. Total counter value at the jam occurred.

Jam Code	Meaning
001	Jams at power on.
010	Paper does not reach the registration sensor (from paper tray unit)
011	Paper does not reach the 1st relay sensor.
030	Paper does not reach the 2nd relay sensor.
031	Paper does not reach the 3rd relay sensor.
032	Paper does not reach the LCT feed sensor.
050	Paper does not reach the registration sensor (from by-pass unit)
070	Paper caught at the registration sensor.
121	Paper does not reach the exit sensor.
122	Paper caught at the exit sensor.
123	Paper does not reach the duplex entrance sensor.
124	Paper caught at the duplex entrance sensor.
125	Paper does not reach the duplex exit sensor.
131	Paper does not reach the bridge exit sensor.
132	Paper caught at the bridge exit sensor.
133	Paper does not reach the bridge relay sensor.
134	Paper caught at the bridge relay sensor.
149	Paper does not reach the 1 bin exit sensor
150	Paper caught at the 1 bin exit sensor.

160	Paper does not reach the finisher entrance sensor.
161	Paper caught at the finisher entrance sensor.
162	Paper does not reach the finisher exit sensor.
163	Paper caught at the finisher exit sensor.
164	Paper does not reach the staple tray.
165	Paper stays in the staple tray.

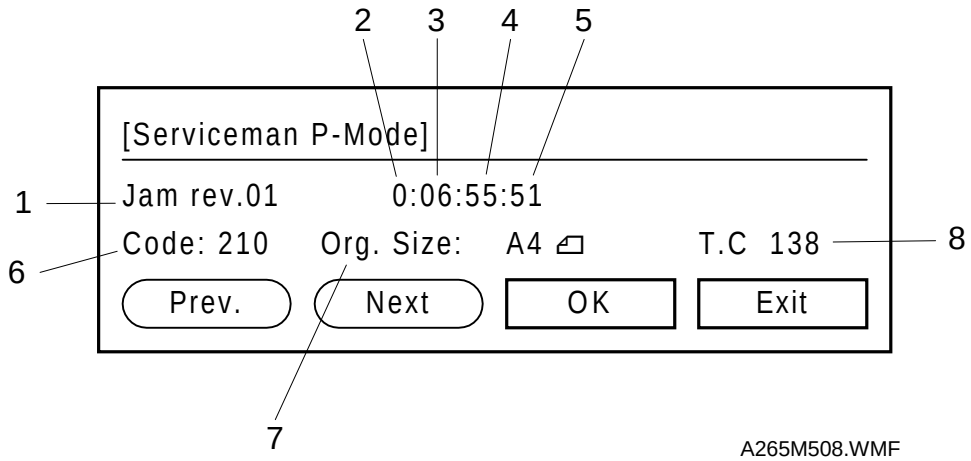
NOTE: The NVRAM can store data for up to 10 copy jams. If more than 10 copy jams occur, the oldest data is erased.

4.2.7 SMC DATA LISTS (SP5-992)

1. Access SP mode 5-992 and select the number corresponding to the list that you wish to print.
2. Press the (Interrupt) key on the operation panel to access the copy mode display.
3. Select the paper size.
4. Press the (Start) key on the operation panel to print the list.
5. After printing the list, exit copy mode by pressing the (Interrupt) key on the operation panel.
6. Exit SP mode.

4.2.8 ORIGINAL JAM HISTORY DISPLAY (SP7-905)

After entering the SP mode, select “1” and press the “OK” or # key. The following message is displayed.



1. Jam history number
2. Main motor operating time: Date
3. Hour
4. Minute
5. Second
6. Jam code (see the table below)
7. Original size
8. Total counter value at the original jam occurred.

Jam Code	Meaning
210	Original does not reach the registration sensor.
211	Original caught at the registration sensor.
212	Original does not reach the feed-out sensor.
213	Original caught at the feed-out sensor.
214	Original does not reach the inverter sensor.
215	Original caught at the inverter sensor.
216	Short interval between originals.
218	No original at the stamp.

NOTE: The NVRAM can store data for up to 10 copy jams. If more than 10 copy jams occur, the oldest data will be erased.

4.2.9 MEMORY ALL CLEAR (SP5-801)

NOTE: Memory All Clear mode resets all the settings and counters stored in the NVRAM to the defaults, except for the following:

- Electrical total counter value (SP7-003)
- Machine serial number (SP5-811)
- Plug & Play brand name and production name setting (SP5-907)
- Some SBU settings (SP4-904-3, SP4-904-4, SP4-906, SP4-909)
- Language UK/TW Priority (SP5-916) – Asia and Taiwan version only

Normally, this SP mode should not be used. This procedure is necessary only after replacing the NVRAM, or when the copier malfunctions because the NVRAM is damaged.

Using a Flash Memory Card

1. Upload the NVRAM data to a flash memory card (see NVRAM Data Upload).
2. Print out all SMC data lists (SP mode 5-992).
   NOTE: Be sure to print out all the lists. If the NVRAM data upload was not completed, it is necessary to change the SP mode settings by hand.
3. Access SP mode 5-801.
4. Hold the "Original Type" key and the "OK" or # key at the same time. (If the operation was successful, the beeper will sound 5 times. If it failed, the beeper will sound only twice.)
5. Turn the main switch off and back on.
6. Download the NVRAM data from a flash memory card (see NVRAM Data Download).

Without Using a Flash Memory Card

If there is no flash memory card, follow the steps below.

1. Print out all SMC Data Lists (SP mode 5-992).
2. Access SP mode 5-801.
3. Hold the "Original Type" key and the "OK" or # key at the same time. (If the operation was successful, the beeper will sound 5 times. If it failed, the beeper will sound only twice.)
4. Turn the main switch off and back on.
5. Do the printer and scanner registration and magnification adjustments (see Replacement and Adjustment - Copy Adjustments).
6. Referring to the SMC data lists, re-enter any values that differ from the factory settings. In particular, the values for SP4-904-1, SP4-904-2, SP4-905, and SP4-907 must be re-entered.
7. Do the standard white level adjustment (SP4-908). (See Replacement and Adjustment – Standard White Density Adjustment for details.)
8. Check the copy quality and the paper path, and do any necessary adjustments.

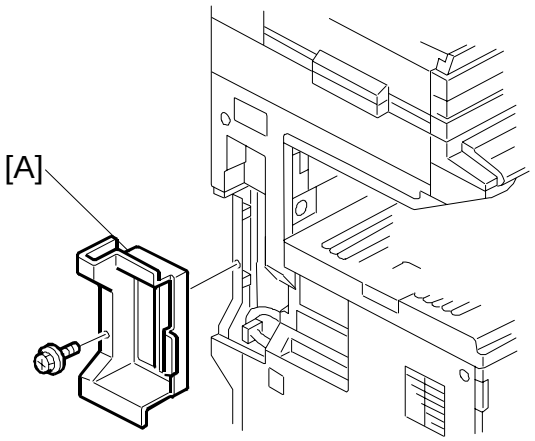
4.2.10 PROGRAM UPLOAD/DOWNLOAD

In this machine, the BICU software is upgraded using a flash memory card.

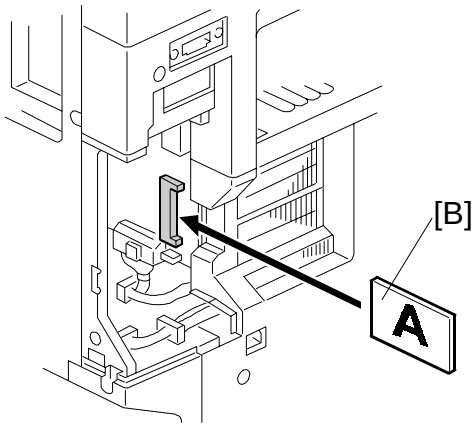
There are two program download procedures.

- SP5-826: Uploads from the BICU to a flash memory card.
- SP5-827: Downloads from a flash memory card to the BICU.

Program Download (SP5-827)



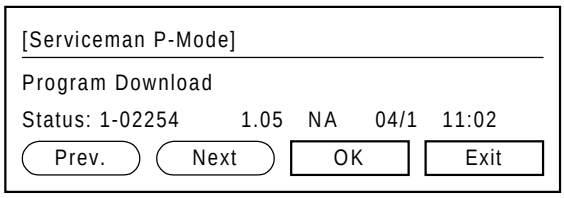
A265M514.WMF



A265M500.WMF

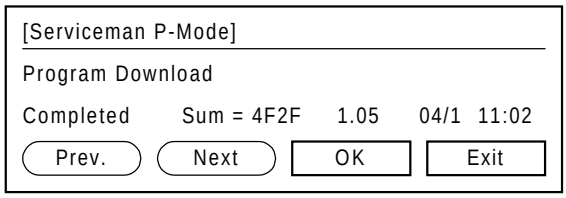
1. Turn off the main switch.
2. Remove the application cover [A] (1 screw).
3. Plug the flash memory card [B] into the card slot.
   NOTE: Make sure that the surface printed “A” faces the back side of the machine (as viewed from the front of the machine).
4. Hold the (Energy Saver) key and turn on the main switch.
   NOTE: To access SP mode 5-827 directly, hold the (Energy Saver) key and “1” key at the same time, then turn on the main switch. Go to step 5.
5. Access SP mode 5-827.
6. Press “1” key, then press the “OK” button to download the software.
7. The machine erases the current software, then writes the new software to the BICU. This takes about 60 seconds. If downloading failed, an error message appears, as follows. At this time, repeat the download procedure.
8. After finishing the software download, turn off the main switch and remove the IC card.

Display during writing



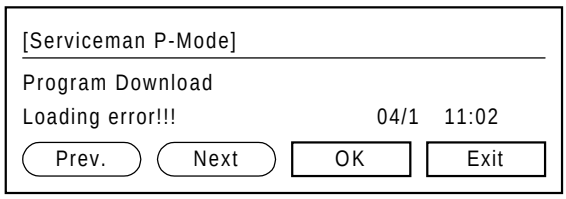
A265M506.WMF

Display when the download is complete



A265M504.WMF

Display if writing failed



A265M505.WMF

NOTE: To see the current firmware version, check SP 7-801-2.

Program Upload (SP5-826)

1. Turn off the main switch.
2. Plug the flash memory card [A] into the card slot (see previous page).
   NOTE: Make sure that the surface printed “A” faces the rear side of the machine (as viewed from the front of the machine).
3. Turn on the main switch.
4. Access SP mode 5-826.
5. The machine erases the current software, then writes the new software to the flash memory card. This takes about 60 seconds. If uploading failed, an error message appears. At this time, repeat the upload procedure.
6. Turn off the main switch, then remove the IC card.

4.2.11 NVRAM DATA DOWNLOAD

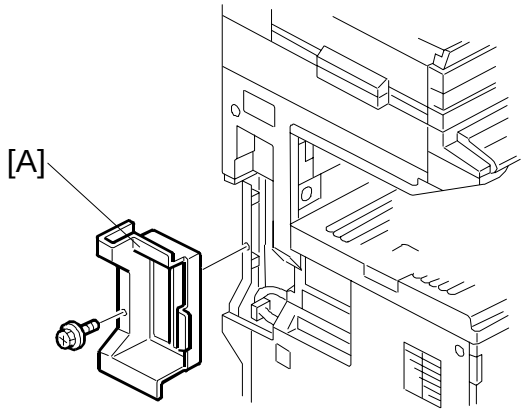
After doing the memory all clear procedure, NVRAM data will be reset to their default settings. So it is necessary to upload the NVRAM data before clearing the NVRAM, and to download the NVRAM data afterwards.

- SP5-824: Uploads from the BICU to a flash memory card.
- SP5-825: Downloads from a flash memory card to the BICU.

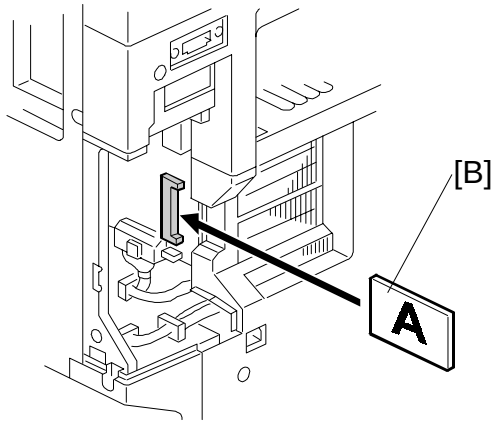
NVRAM Data Download (SP5-825)

NOTE: This procedure downloads all the settings stored in the NVRAM except for the following items:

- Electrical total counter value (SP7-003)
- Machine serial number (SP5-811, SP5-920, SP5-925)
- Plug & Play brand name and production name setting (SP5-907)
- Some SBU settings (SP4-904-3, SP4-904-4, SP4-906, SP4-909)



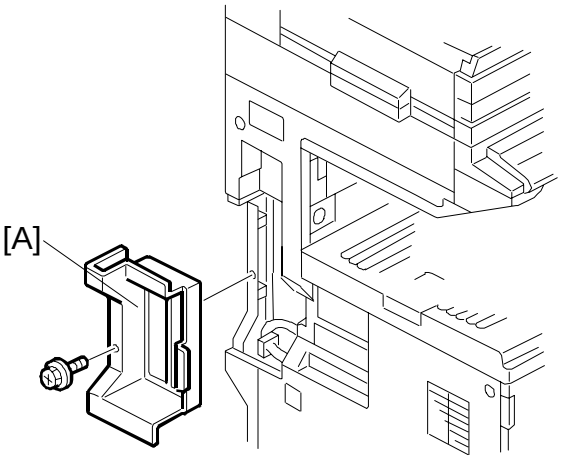
A265M514.WMF



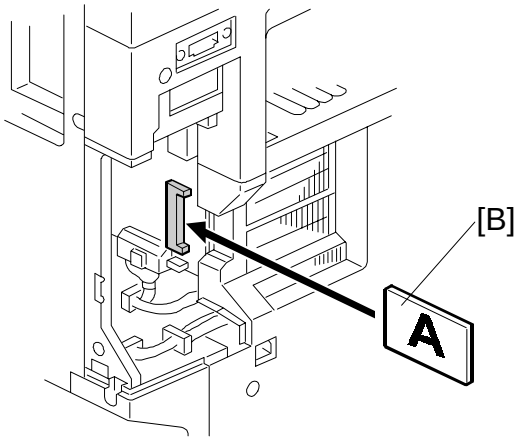
A265M500.WMF

1. Turn off the main switch.
2. Remove the application cover [A] (1 screw).
3. Plug the flash memory card [B] into the card slot.
   NOTE: Make sure that the surface printed “A” faces the rear side of the machine (as viewed from the front of the machine).
4. Turn on the main switch.
5. Access the SP mode 5-825.
6. The machine erases the current settings, then writes the new settings onto the NVRAM on the BICU board. If downloading failed, an error message appears (see “Program Download”). At this time, repeat the download procedure.
7. Turn off the main switch, then remove the IC card.

NVRAM Data Upload (SP5-824)



A265M514.WMF

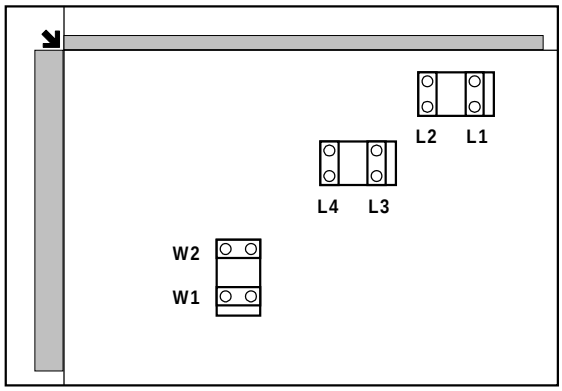


A265M500.WMF

1. Turn off the main switch.
2. Remove the application cover [A] (1 screw).
3. Plug the flash memory card [B] into the card slot.
   NOTE: Make sure that the surface printed “A” faces the rear side of the machine (as viewed from the front of the machine).
4. Turn on the main switch.
5. Access SP mode 5-824.
6. The machine erases the current settings, then writes the machine’s settings to the flash memory card. This takes about 60 seconds. If uploading failed, an error message appears (see “Program Download”). At this time, repeat the upload procedure.
7. Turn off the main switch, then remove the IC card.

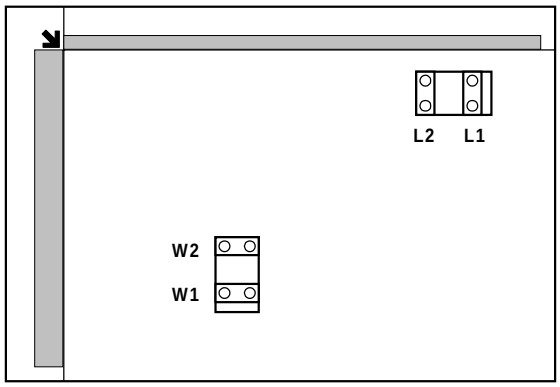
4.2.12 APS AND PLATEN/DF COVER SENSOR OUTPUT DISPLAY (SP4-301)

[230V Machine]

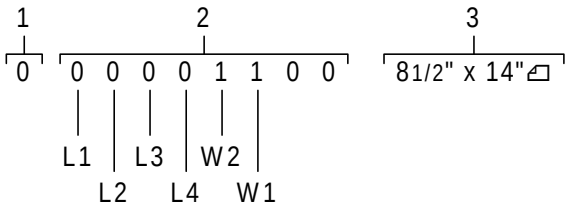


A265M511.WMF

[115V Machine]



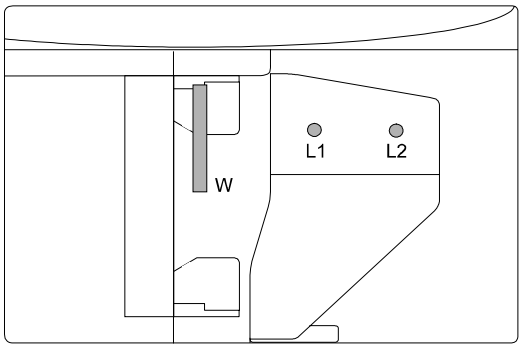
A265M512.WMF



A265M513.WMF

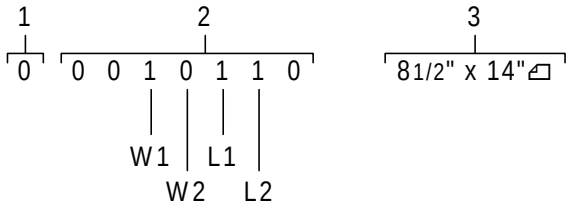
1. Platen cover sensor status 1 = Closed
2. APS sensor status 1 = Paper detected
3. Paper size display

4.2.13 DF APS SENSOR OUTPUT DISPLAY (SP6-901)



A250M600.WMF

	Large ⟷ Small			
W1	0	0	1	1
W2	0	1	0	1

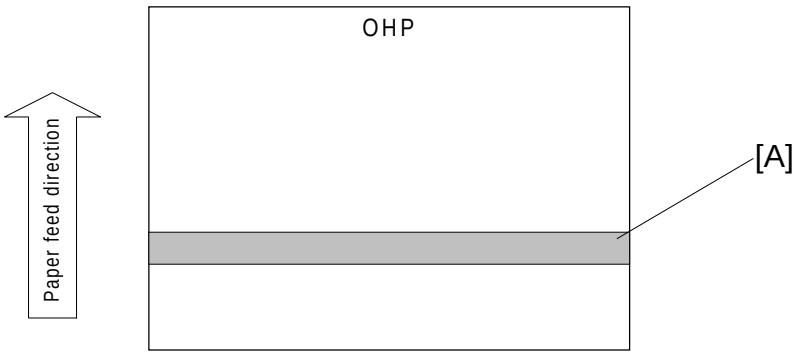


1. Original set sensor status 1 = Paper detected
2. APS sensor status 1 = Paper detected
3. Paper size display

L1	L2	W1	W2	Paper Size	
				inches	mm
0	0	0	0	8 1/2" x 11" Sideways	A4 Sideways
0	0	0	1	-	B5 Sideways
0	0	1	0	8 1/2" x 5 1/2" Sideways	A5 Sideways
0	0	1	1	5 1/2" x 8 1/2" Lengthwise	A5 Lengthwise
1	0	1	0	8 1/2" x 11" Lengthwise	A4 Lengthwise
1	0	1	1	-	B5 Lengthwise
1	1	0	0	11" x 17"	A3
1	1	0	1	10" x 14"	B4
1	1	1	0	8 1/2" x 14"	8 1/2" x 13"

1: Detected

4.2.14 NIP BAND WIDTH MEASUREMENT



A265M501.WMF

When paper wrinkling or image off-set occurs, the pressure from the pressure roller can be adjusted by changing the position of the pressure springs. At this time, the nip band width can also be checked with SP1-109, as follows.

1. Do a free run (SP5-802) for about 50 sheets.
2. Access SP1-109 and press the “1” key.
3. Press the ⇐ key to enter copy mode.
4. Place an OHP sheet (A4/8.5”x11” sideways) on the by-pass tray or in the 2nd paper tray.
5. Press the “Start” key.
   The OHP sheet is stopped in the fusing unit for about 20 seconds, then it will be fed automatically.
6. Check the nip band width [A]. The relationship between the position of the pressure spring and the band width is as follows.
   NOTE: Check the nip band width around the center of the OHP.

1. Pressure spring position	**Nip band width**
Upper (default position)	5.0 ± 0.5 mm
Lower	5.3 ± 0.5 mm
2. Envelope feed mode (green lever down) at the default pressure spring position	4.0 ± 0.5 mm

If the width is out of the above specification, the pressure spring should be replaced.

4.2.15 DISPLAY LANGUAGE (SP5-808)

	US	Europe (standard)	Europe (option 1)	Europe (option 2)	Asia/ Taiwan	China	Russia
0	NA	UK	UK	UK	UK	CN	RU
1	FR	DE	DE	DE	TW	UK	UK
2	ES	FR	FR	FR			
3		IT	IT	IT			
4		ES	ES	ES			
5		NL	SE	CZ			
6			NO	PL			
7			DK	PT			
8			FI	HU *			

*: In the Lanier version. this cannot be selected.

For Europe, select the group (standard, option 1, or option 2) with SP 5-807.

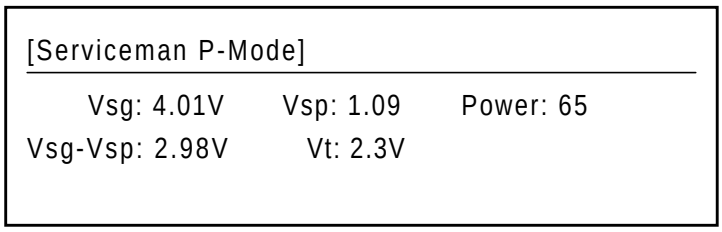
NA: English	UK: English	DE: German	TW: Taiwan
FR: French	IT: Italian	ES: Spanish	CN: Chinese
NL: Dutch	SE: Swedish	NO: Norwegian	RU: Russian
DK: Danish	FI: Finnish	CZ: Czech	
HU: Hungarian	PL: Polish	PT: Portuguese	

4.2.16 SERIAL NUMBER INPUT (SP5-811)

Used to input the machine's serial number. (This is normally done at the factory.) The numeric key pad has 12 buttons. Use the first 11 buttons ① to ⑨, ⑩ and ⓪ to input the serial number (# is not used). Each button represents one digit of the serial number. Press consecutively to get the required letter/number. The first 4 buttons allow you to scroll through number 0 to 9 and "A" to "Z". Buttons 5 to 11 only scroll through numbers 0 to 9.

①	②	③
1st digit	2nd digit	3rd digit
④	⑤	⑥
4th digit	5th digit	6th digit
⑦	⑧	⑨
7th digit	8th digit	9th digit
⑩	⓪	#
10th digit	11th digit	Not used

4.2.17 ID SENSOR ERROR ANALYSIS (SP2-221)



A265M510.WMF

Even if the ID sensor is defective, the machine does not generate an SC condition. If the ID sensor is defective, the image quality becomes worse (e.g., dirty background on the copy). If these conditions occur, check the ID sensor output using this SP mode.

1. Vsg

   Error Condition: Vsg < 2.5V

   Possible causes:

   - ID sensor defective
   - ID sensor dirty
   - Drum does not get charged

2. Vsp

   Error Condition: Vsp > 2.5V

   Possible causes:

   - Toner density is very low
   - ID sensor pattern is not created

3. Power: This is the power for the light source in the ID sensor

   Error Condition: Vsg < 3.5V when maximum power (254) is applied

   Possible causes:

   - ID sensor defective
   - ID sensor dirty
   - Drum does not get charged

4. Vsg-Vsp

   Error Condition: (Vsg – Vsp) < 1.00V

   Possible causes:

   - ID sensor defective
   - Drum dirty

5. Vt

   Error Condition: Vt > 4.5V or Vt < 0.5V

   Possible causes:

   - TD sensor defective

4.3 USER TOOLS

The User Tools are accessed by users and key operators and by sales and service staff. User Tools are used to input or change the copier's default settings.

4.3.1 HOW TO ENTER AND EXIT USER TOOLS

Press the User Tools button, then select the User Tools program. After finishing the User Tools program, press the User Tools button to exit User Tools.

4.3.2 USER TOOLS TABLE

System Setting Table

1. System	1. Function Priority		
	2. Panel Tone		
	3. Copy Count Display		
	4. System Reset		
	5. Function Reset		
	6. Panel Off Timer		
	7. Energy Saver Level		
	8. Energy Saver Timer		
	9. Auto Off Timer		
	10. AOF (Keep It On.)		
	11. Special Paper Size	1. Tray 1	
		2. Tray 2	
		3. Tray 3	
		4. Tray 4	
	12. Pap. Tray Priority		
	13. Auto Tray Switch		
	14. Special Paper Indicator	1. Tray 1	
		2. Tray 2	
		3. Tray 3	
		4. Tray 4	
	15. Output Tray Priority	1. Copier	1. Paper Tray
			2. Bypass Tray
		2. FAX	1. Paper Tray
			2. Bypass Tray
		3. Printer	1. Paper Tray
			2. Bypass Tray
	16. Print Priority		
	17. Display Contrast		
	18. Key Operators Tools	1. Show/Print Counter	
		2. Print Counter List	
		3. Key Operator Access	
		4. Program Key Operator Code	
		5. Restricted Access	1. Copier
			2. Fax
			3. Printer

Copy Setting Table

2. Copier	1. General Features	1. APS Priority	
		2. ADS Priority	1. Text
			2. Text/Photo
			3. Photo
		3. Original Priority	
		4. Quick Mode Check	
		5. Max. Copy Q'ty	
		6. Original Tone	
		7. Re./En. Priority	
		8. Image Mode Select	
		9. Image Mode Adjustment	1. Normal Mode
			2. Enhanced Mode
		10. Image Density (Text)	
		11. Duplex Priority	
		12. Cover/OHP Tray	
		13. Copy Reset Timer	
		14. Initial Mode Set	
		15. Bypass Mode Clear	
		16. Key operator Tools	1. User Code Management
			2. Counter Reset
			3. Clear Code/Counter
			4. Program User Code
			5. Chg/Del User Code
			6. Counter List Print
	2. Adjust Image	1. Border Erase Width	
		2. Center Erase Width	
		3. Left Duplex Margin	
		4. Top duplex margin	
		5. Line (Combine)	
		6. Line (Repeat)	
	3. Input/Output	1. Duplex Auto Eject	
		2. Combine Auto Eject	
		3. Original Count	
		4. SADF Auto Reset	
		5. Rotate Sort Auto Paper Count	
		6. Sort	
	4. Stamp Setting	1. Page No. Priority	
		2. Page No. Size	
		3. Duplex Back Page No.	
		4. Page No. (Combine)	
		5. Page No. position	
		6. Page No. Adjustment	
		7. Stamp Priority	
		8. Stamp Size	
		9. Stamp Density	
		10. Stamp Position	
		11. Stamp Adjustment	
		12. Stamp page priority	

4.4 LEDS

BICU

Number	Function
LED 102	Monitors the +5 V line for the slave CPU. Usually, this LED is blinking.
LED 103	Monitors the +5 VE line. Usually, this LED is lit.

IOB

Number	Function
LED 100	Monitors the connection between the IOB and the BICU. Usually, this LED is blinking.

4.5 SPECIAL TOOLS AND LUBRICANTS

4.5.1 SPECIAL TOOLS

Part Number	Description	Q'ty
54209516	Test Chart - OS-A3 (10 pcs/set)	1
A0069104	Scanner Positioning Pin (4 pcs/set)	1
A0299387	Digital Multimeter - FLUKE 87	1
A2309351	Case - Flash Memory Card	1
A2309352	Flash Memory Card - 4MB	1
A2679001	NVRAM - Minus Counter	1
A2309003	Adjustment Cam – Laser Unit	1
A2679002	Positioning Pin - Laser Unit	1

4.5.2 LUBRICANTS

Part Number	Description	Q'ty
A0289300	Grease Barrierta - JFE 5 5/2	1
52039501	Silicone Grease G-501	1

5. PREVENTIVE MAINTENANCE SCHEDULE

5.1 PM TABLE

NOTE: 1) The amounts mentioned as the PM interval indicate the number of prints.
2) After carrying out PM, clear the maintenance counter (SP7-804).

Symbol key: C: Clean, R: Replace, L: Lubricate, I: Inspect

A265/A267	EM	120K	240K	360K	NOTE
SCANNER/LASER OPTICS					
Reflector		C	C	C	Optics cloth
1st Mirror	C	C	C	C	Optics cloth
2nd Mirror	C	C	C	C	Optics cloth
3rd Mirror	C	C	C	C	Optics cloth
Scanner Guide Rails		C	C	C	Do not use alcohol.
Platen Sheet Cover	C	I	I	I	Replace the platen sheet, if necessary. Dry cloth or alcohol
Exposure Glass		C	C	C	Dry cloth or alcohol
Toner Shield Glass		C	C	C	Optics cloth
APS Sensor		C	C	C	Dry cloth or blower brush
AROUND THE DRUM					
Transfer/Separation Unit		R	R	R	
ID Sensor		C	C	C	Perform the ID sensor initial setting (SP3-927) after cleaning (blower brush)
PAPER FEED					
Registration Rollers	C	C	C	C	Clean with water
Paper Feed Roller	C	R	R	R	Clean with water
Friction Pad	C	R	R	R	Dry cloth
Paper Feed Guides	C	C	C	C	Clean with alcohol.
Relay Rollers	C	C	C	C	Clean with water.
Bottom Plate Pad	C	C	C	C	Clean with water.
Registration Roller Mylar	C	C	C	C	Clean with water.
FUSING UNIT AND PAPER EXIT					
Fusing Entrance and Exit Guide Plates		C	C	C	Clean with water or alcohol.
Hot Roller		R	R	R	
Pressure Roller		R	R	R	

A265/A267	EM	120K	240K	360K	NOTE
Fusing Thermistor		C	C	C	Clean if necessary (suitable solvent)
Cleaning Roller		C	C	C	Clean with water or alcohol.
Cleaning Roller Bushings		C	C	C	Clean with water or alcohol.
Hot Roller Strippers		R	R	R	
Hot Roller Bushing		I	I	I	Clean if necessary
Paper Exit Guide Ribs		C	C	C	Clean with water or alcohol.
OTHERS					
Main Motor Drive Gear	L	I	I	I	Silicone Grease G501 (see note 1)

	EM	120K	240K	360K	NOTE
ADF (for originals)					
Pick-up Roller	C	R	R	R	Clean with water
Feed Belt	C	R	R	R	Clean with water
Separation Roller	C	R	R	R	Clean with water
Stamp		I	I	I	Replace if necessary
ADF Exposure Glass	C	C	C	C	Clean with alcohol
White Plate	C	C	C	C	Clean with alcohol
Platen Sheet	C	C	C	C	Clean with alcohol

	EM	120K	240K	360K	NOTE
PAPER TRAY UNIT					
Paper Feed Roller	C	R	R	R	Clean with water
Friction Pad	C	R	R	R	Dry cloth
Paper Feed Guides	C	C	C	C	Clean with alcohol.
Relay Rollers	C	C	C	C	Clean with water.
Bottom Plate Pad	C	C	C	C	Clean with water.
Relay Clutch		I	I	I	Replace if necessary
Paper Feed Clutch		I	I	I	Replace if necessary

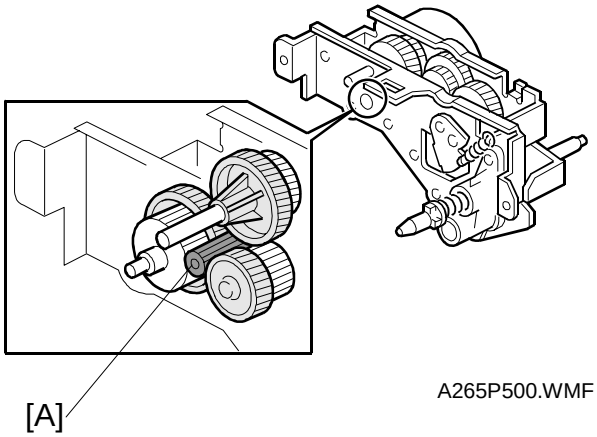
	EM	120K	240K	360K	NOTE
LCT					
Paper Feed Roller		R	R	R	
Pick-up Roller		R	R	R	
Separation Roller		R	R	R	
Transport Rollers		C	C	C	Clean with water
Bottom Plate Pad		C	C	C	Clean with water
Relay Clutch		I	I	I	Replace if necessary
Paper Feed Clutch		I	I	I	Replace if necessary

	EM	120K	240K	360K	NOTE
1,000-SHEET FINISHER					
Rollers	C				Clean with water or alcohol.
Brush Roller	I	I	I	I	Replace if necessary.
Discharge Brush	C	C	C	C	Clean with a dry cloth
Sensors	C				Blower brush
Jogger Fences	I	I	I	I	Replace if necessary.
Punch Waste Hopper	I	I	I	I	Empty the hopper.

	EM	150K	300K	450K	NOTE
1-BIN TRAY UNIT					
Rollers	C				Dry or damp cloth
Copy Tray	C				Dry or damp cloth
Sensors	C				Blower brush

NOTE 1.

Main Motor Drive Gear



A265P500.WMF

Do the following every EM:

Lubricate the main motor drive gear [A] with silicone grease G501.

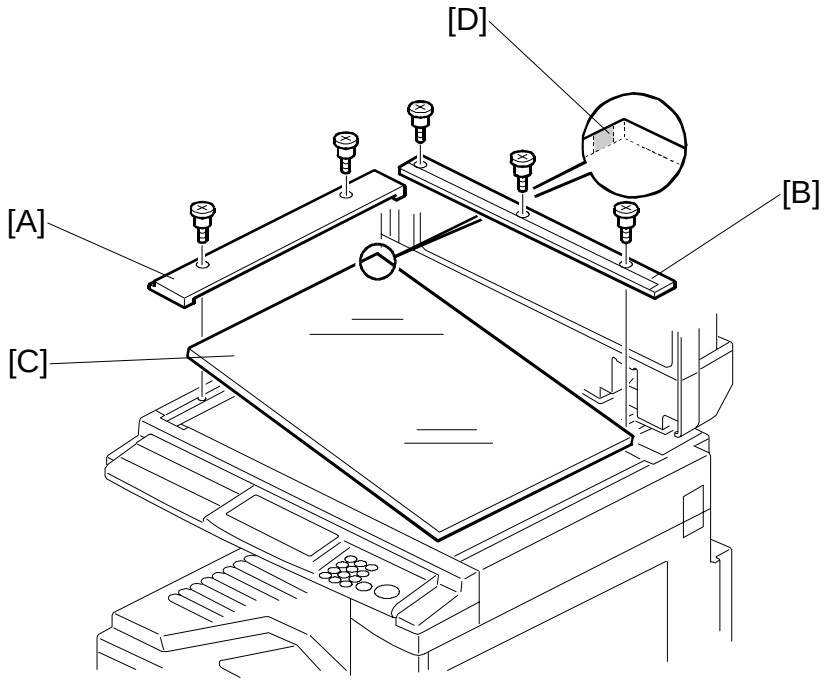
6. REPLACEMENT AND ADJUSTMENT

⚠CAUTION

Turn off the main power switch and unplug the machine before attempting any of the procedures in this section.

6.1 SCANNER UNIT

6.1.1 EXPOSURE GLASS

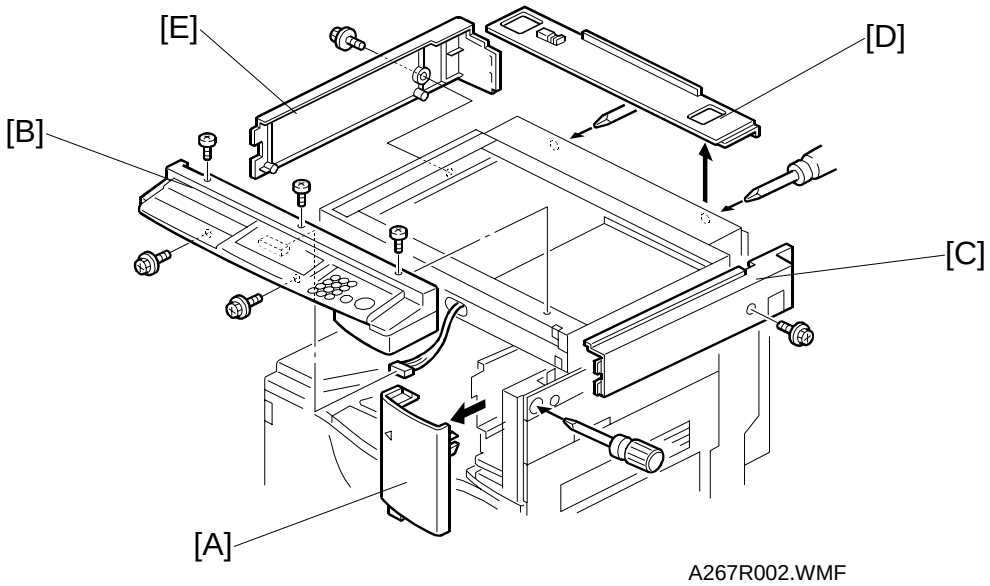


A267R001.WMF

1. Open the ADF or platen cover.
2. Remove the left scale [A] (2 screws).
3. Remove the rear scale [B] (3 screws).
4. Remove the exposure glass [C].

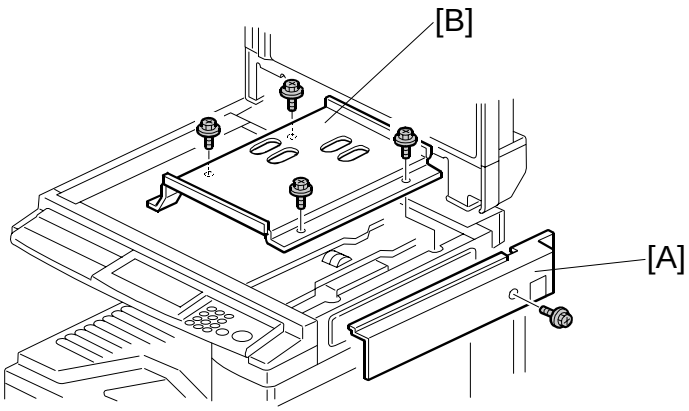
NOTE: When reinstalling the exposure glass, make sure that the mark [D] is positioned at the rear left corner, as shown.

6.1.2 SCANNER EXTERIOR/OPERATION PANEL

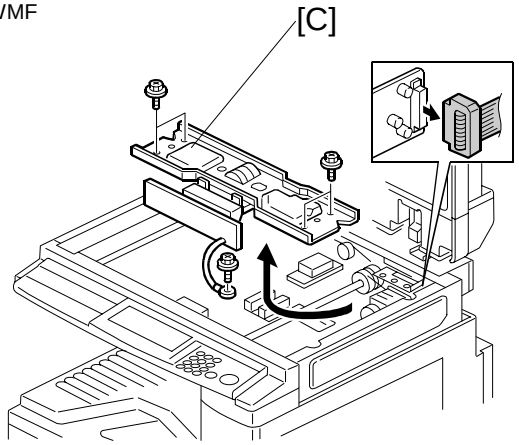


1. Remove the ADF or platen cover.
2. Remove the exposure glass. (See Exposure Glass.)
3. Remove the upper front cover [A] (1 screw, 1 hook).
4. Remove the operation panel [B] (5 screws, 1 connector).
5. Remove the right cover [C] (1 screw, 2 hooks).
6. Remove the rear cover [D] (2 screws).
7. Remove the left cover [E] (2 screws, 2 hooks).

6.1.3 LENS BLOCK ASSEMBLY



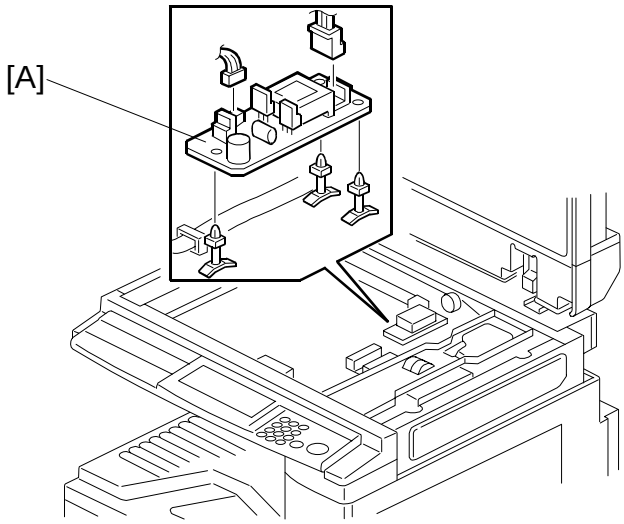
A267R003.WMF



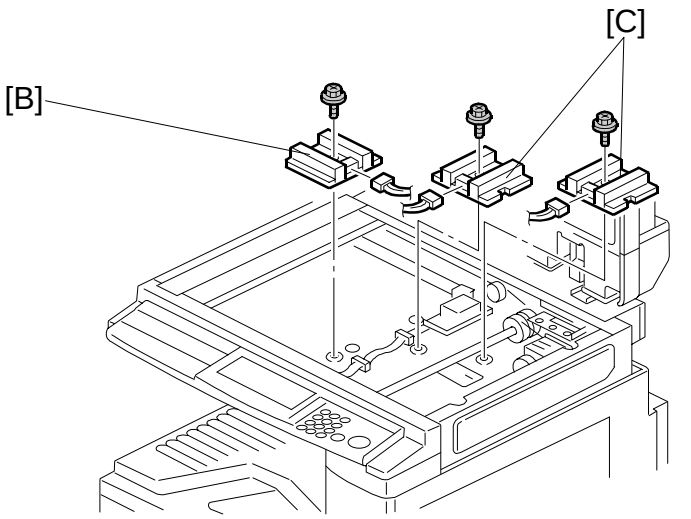
A267R006.WMF

1. Remove the exposure glass. (See Scanner Exterior/Exposure Glass.)
2. Remove the right cover [A]. (See Scanner Exterior/Exposure Glass.)
3. Remove the lens cover [B] (4 screws).
4. Replace the lens block assembly [C] (5 screws, 1 connector).
   NOTE: Do not remove the screws which are locked with white paint.
5. Reassemble the machine and do the scanner and printer copy adjustments. (See Copy Adjustments.)

6.1.4 ORIGINAL SIZE SENSORS/LAMP STABILIZER



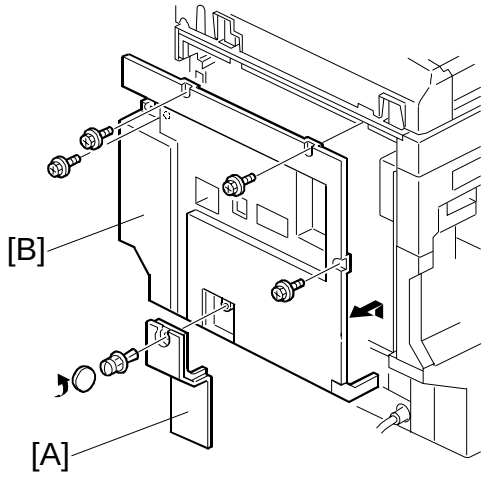
A267R005.WMF



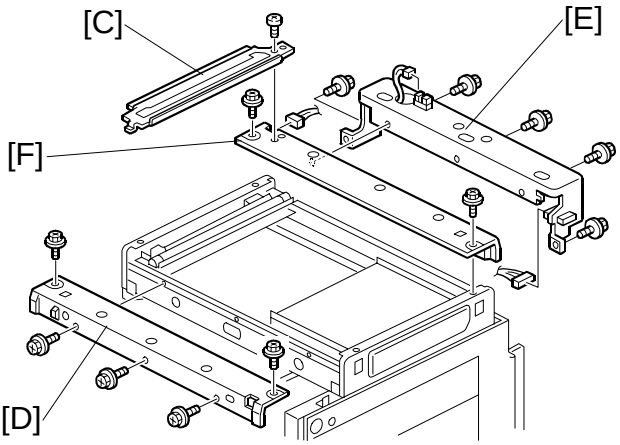
A267R004.WMF

1. Remove the exposure glass. (See Exposure Glass.)
2. Remove the lens cover. (See Lens Block.)
3. Remove the lamp stabilizer [A] (2 connectors).
4. Remove the original width sensor [B] (1 screw, 1 connector).
5. Remove the lens block. (See Lens Block Assembly.)
6. Remove the original length sensors [C] (1 screw, 1 connector each).

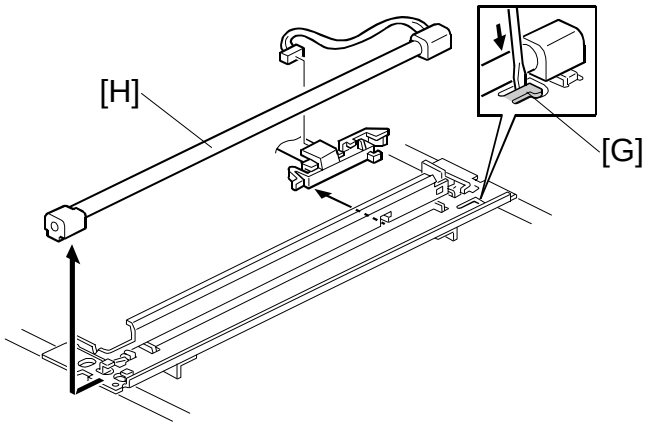
6.1.5 EXPOSURE LAMP



A267R515.WMF



A267R008.WMF

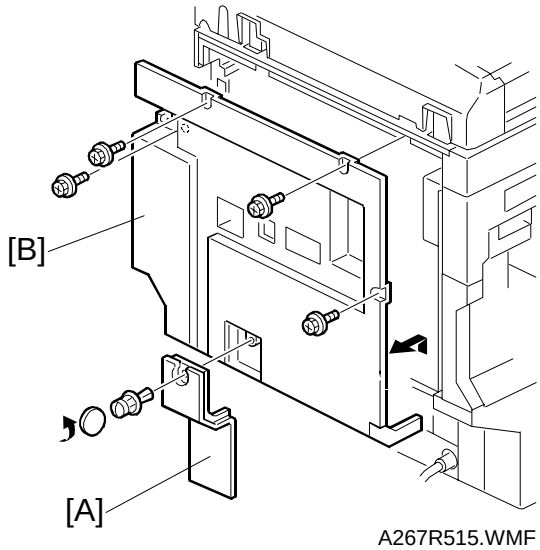


A267R009.WMF

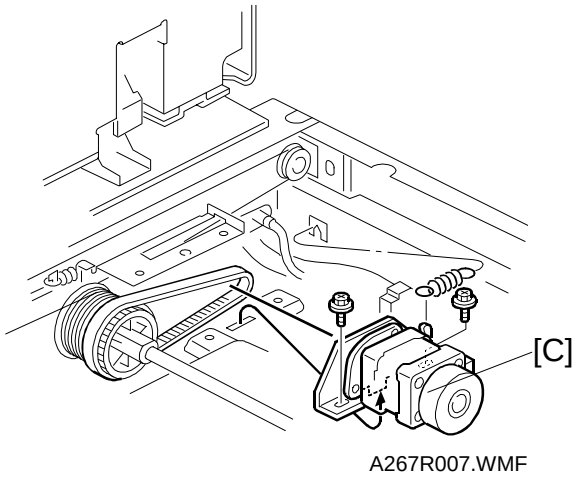
1. Remove the exposure glass. (See Exposure Glass.)
2. Remove the operation panel, rear cover, and left cover. (See Scanner Exterior/Operation Panel.)
3. Remove the connector cover [A], disconnect the cable, and remove the rear cover [B] (4 screws).
4. Remove the left upper stay [C] (1 screw).
5. Remove the front frame [D] (5 screws).
6. Remove the rear bracket [E] (5 screws, 2 connectors).
7. Remove the rear frame [F] (2 screws, 1 connector).
8. Push down the part [G] then slide out the exposure lamp [H] (1 connector).

NOTE: 1) Do not touch the glass surface of the exposure lamp with bare hands.
2) After installing the lamp, the part [G] must be returned to the original position.

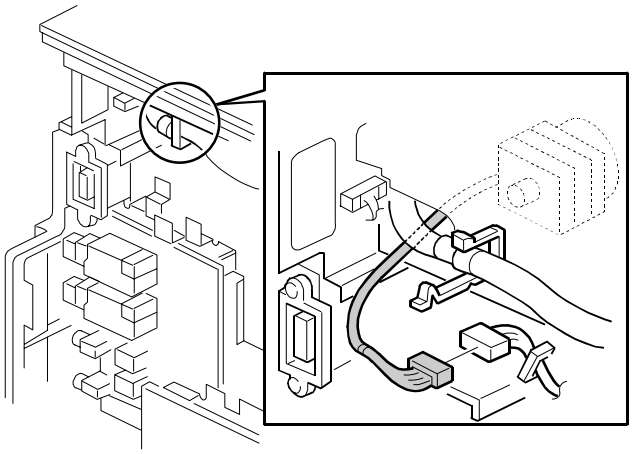
6.1.6 SCANNER MOTOR



A267R515.WMF



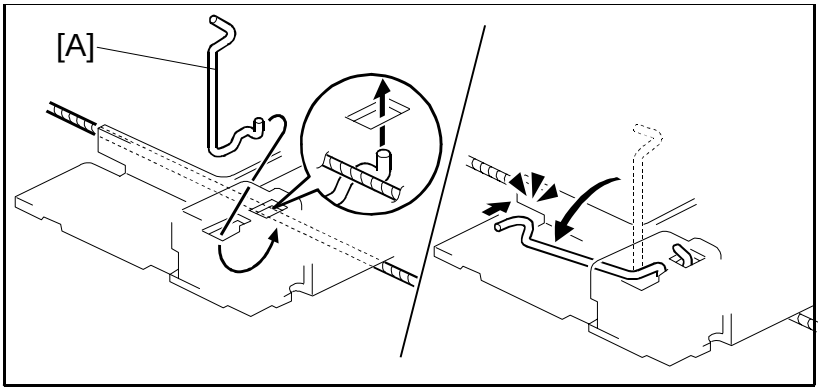
A267R007.WMF



A267R014.WMF

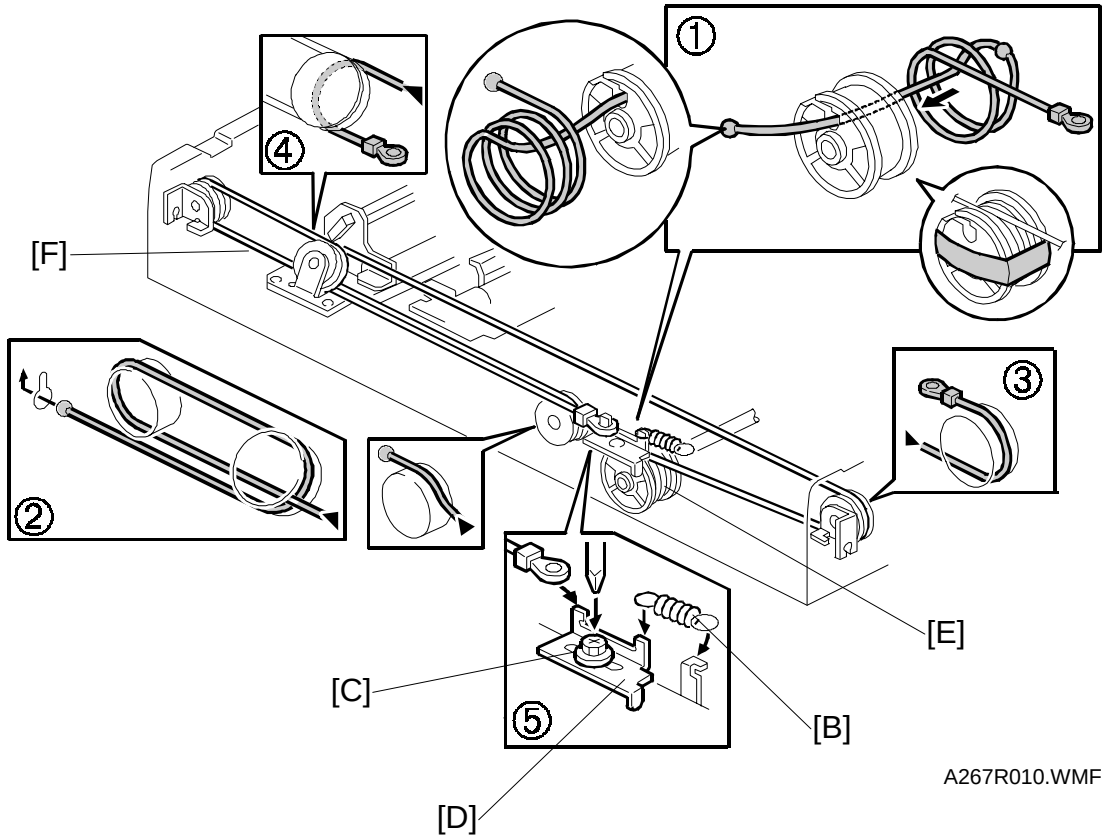
1. Remove the connector cover [A], disconnect the cable, and remove the rear cover [B].
2. Remove the exposure glass. (See Exposure Glass.)
3. Remove the lens block. (See Lens Block Assembly.)
4. Replace the scanner motor [C] (2 screws, 1 spring, 1 connector).
5. Reassemble the machine and do the scanner and printer copy adjustments. (See Copy Adjustments.)

6.1.7 SCANNER WIRES

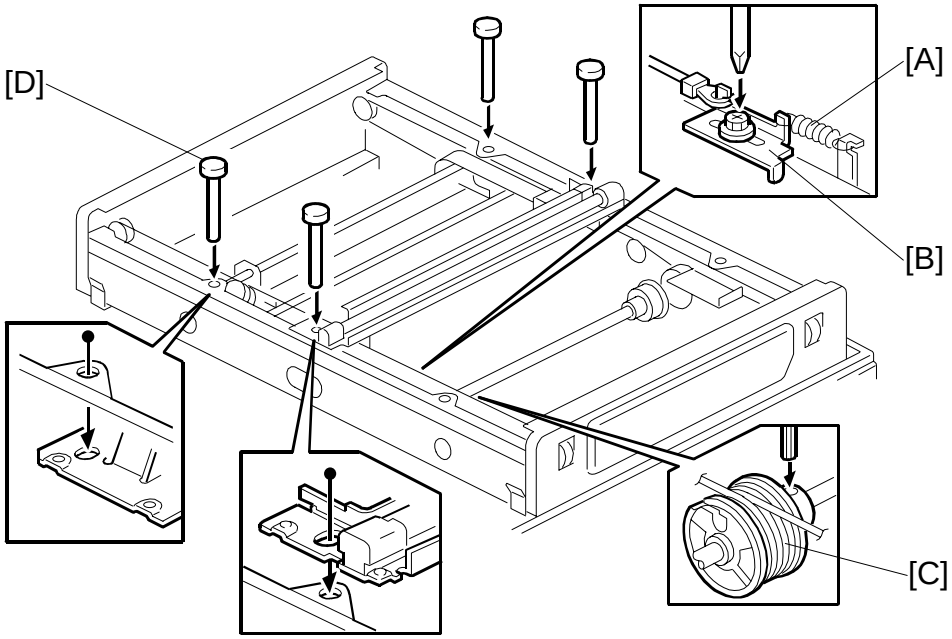


A267R012.WMF

1. Remove the exposure glass, operation panel, and all scanner exterior covers. (See Exposure Glass and Scanner Exterior/Operation Panel.)
2. Remove the left upper stay. (See Exposure Lamp.)
3. Remove the front frame. (See Exposure Lamp.)
4. Remove the rear bracket. (See Exposure Lamp.)
5. Remove the rear frame. (See Exposure Lamp.)
6. Remove the lens cover. (See Lens Block Assembly.)
7. Remove the lens block assembly. (See Lens Block Assembly.)
8. Remove the front and rear scanner wire pins [A]. Then, remove the 1st scanner.



9. Remove the tension spring [B].
10. Loosen the screw [C] securing the wire tension bracket [D].
11. Remove the scanner drive pulley [E] (1 set screw).
12. Remove the scanner wire [F].
13. Wrap the new scanner wire around the pulley as shown ①, then temporarily secure the pulley with tape.
14. Re-install the 1st scanner. Then secure the 1st and 2nd scanner with the scanner positioning tools (P/N A0069104), as shown in the illustration on the next page.
15. Wind the new scanner wire around the scanner drive pulley in the correct way, as shown.
16. Wind the end of the new wire with the ball as shown (②).
17. Wind the end of the new wire with the ring as shown (③,④, and ⑤).
18. Install the tension spring on the wire tension bracket (⑤).
19. Wind the new scanner wire for the other side as well.



A267R011.WMF

20. Secure the 1st scanner with the scanner wire pins.
21. Install the tension spring [A] to the tension bracket.
22. Tighten the tension bracket [B].
23. Secure the scanner wire pulley [C] (1 Allen screw).
24. Remove the positioning tools [D]. After sliding the scanner to the right and left several times, re-install the positioning tools to check the scanner wire bracket and tension bracket again.
25. Reassemble the scanner and do the scanner and printer copy adjustments (see Copy Adjustments).

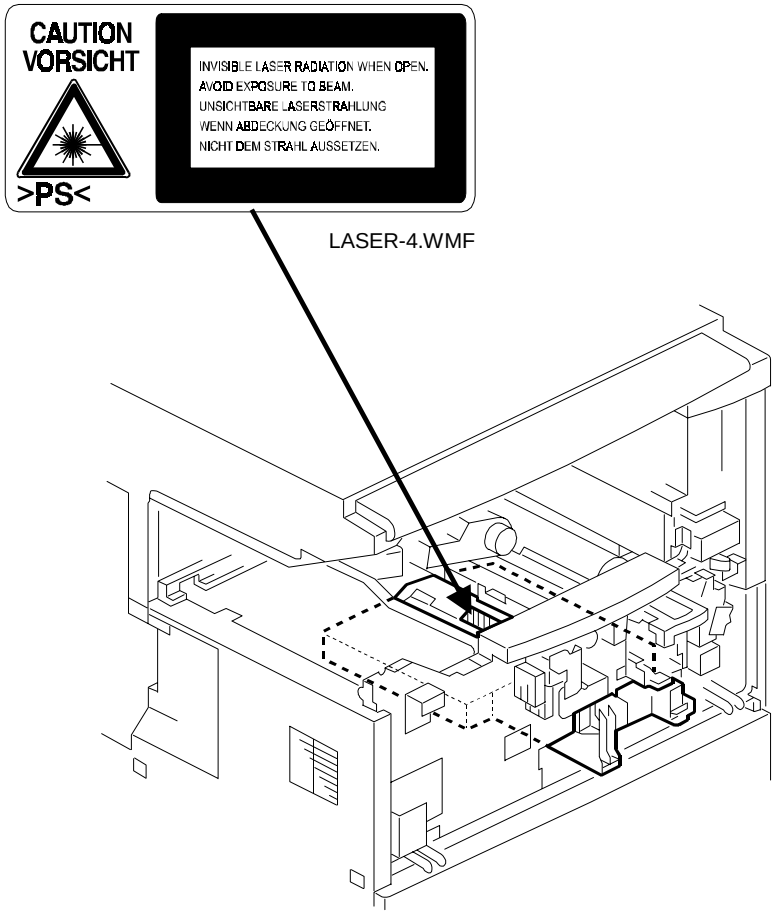
6.2 LASER UNIT

⚠WARNING

Turn off the main power switch and unplug the machine before attempting any of the procedures in this section. Laser beams can seriously damage your eyes.

6.2.1 CAUTION DECAL LOCATIONS

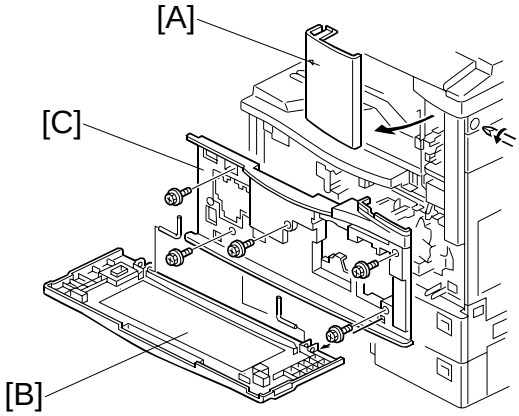
Two caution decals are located in the laser section as shown below.



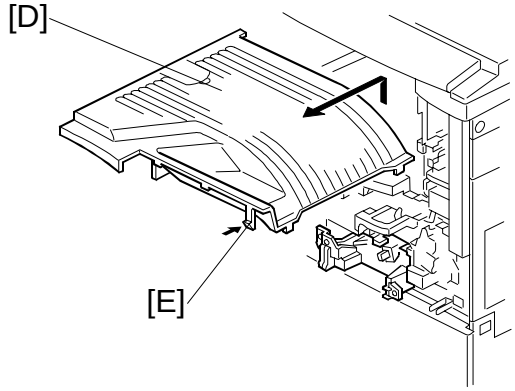
LASER-4.WMF

A267I104.WMF

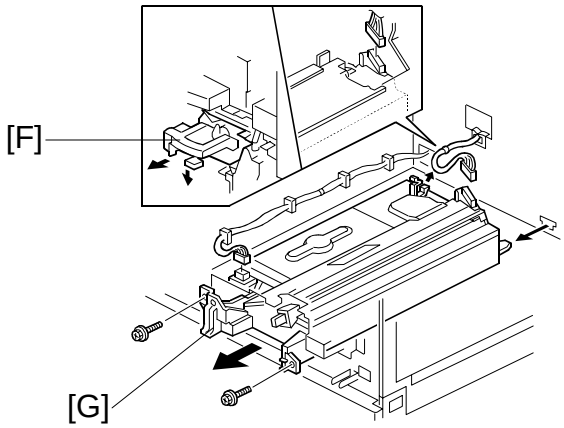
6.2.2 LASER UNIT



A267R101.WMF



A267R102.WMF



A267R103.WMF

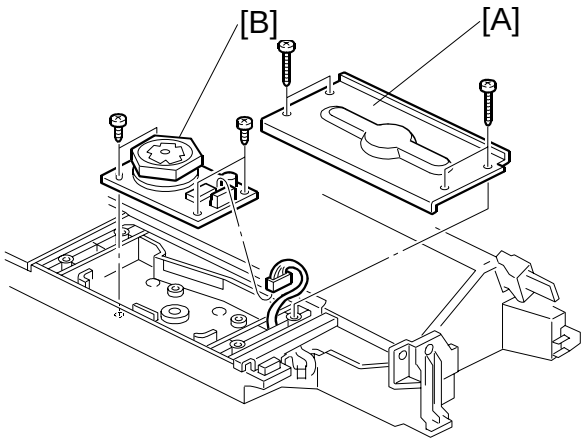
⚠WARNING

Turn off the main power switch and unplug the machine before attempting this procedure. Laser beam can seriously damage your eyes.

Replacement Adjustment

1. Remove the optional finisher/bridge unit, and either the tray for the optional 1-bin tray unit or optional shift tray, if these units have been installed.
2. Remove the upper front cover [A] (1 screw, 1 hook).
3. Remove the front cover [B] (2 pins).
4. Remove the inner cover [C] (5 screws).
5. Remove the copy tray [D] (1 hook [E]).
6. Remove the toner bottle holder [F].
7. Remove the laser unit [G] (2 screws, 2 connectors).
8. After reassembling the machine, do the scanner and printer copy adjustments. (See Copy Adjustments.)

6.2.3 POLYGON MIRROR MOTOR

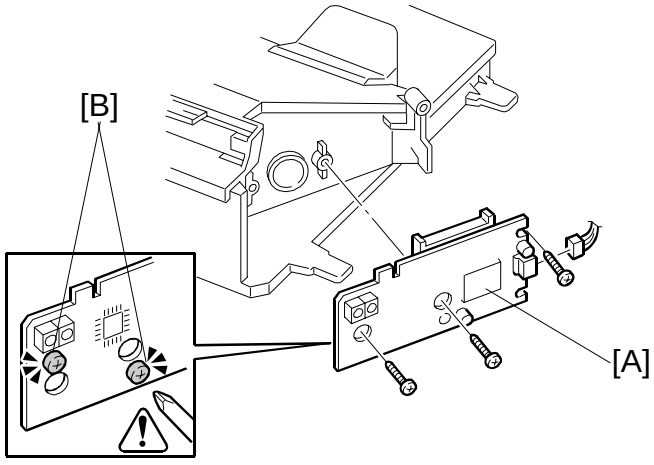


A267R104.WMF

1. Remove the laser unit (see Laser Unit).
2. Remove the heat sink [A] (4 screws).
3. Replace the polygon mirror motor [B] (4 screws, 1 connector).

NOTE: When installing the new polygon mirror motor, do not touch the surface of the mirror with bare hands.

6.2.4 LD UNIT

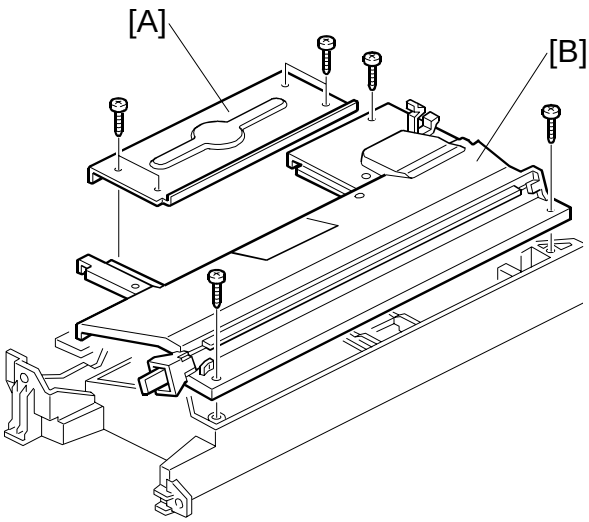


A267R105.WMF

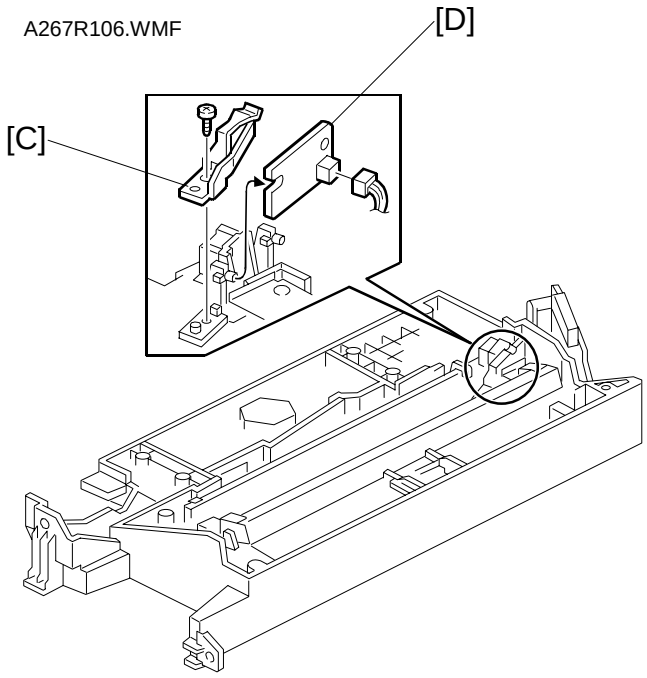
1. Remove the laser unit (see Laser Unit).
2. Replace the LD unit [A] (3 screws, 1 connector).

NOTE: 1) Do not remove the screws [B].
2) Do not touch any variable resistors on the LD unit.

6.2.5 LASER SYNCHRONIZATION DETECTOR



A267R106.WMF

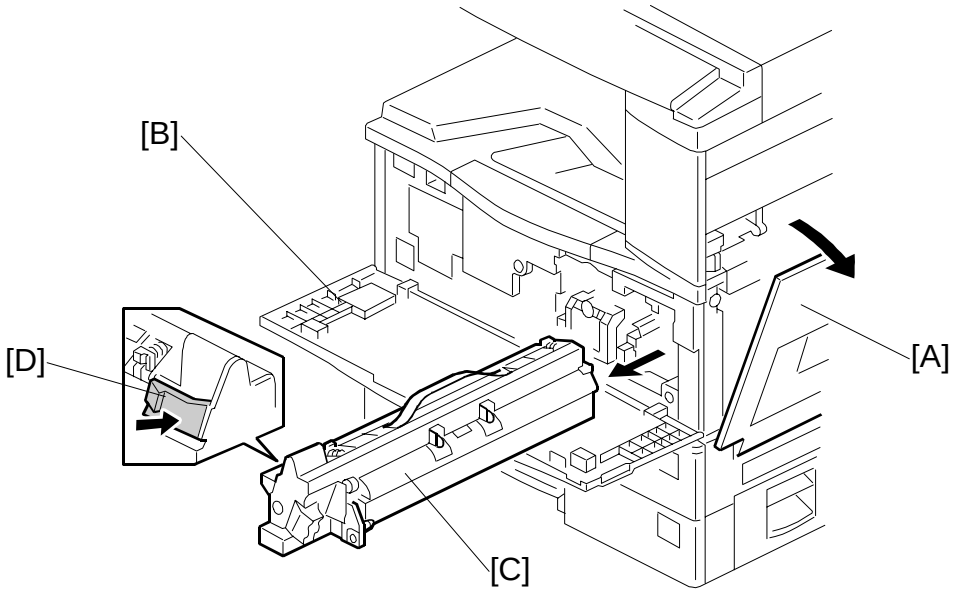


A267R107.WMF

1. Remove the laser unit (See Laser Unit).
2. Remove the heat sink [A] (4 screws).
3. Remove the laser unit cover [B] (3 screws).
4. Remove the bracket [C] (1 screw).
5. Replace the laser synchronization detector [D] (1 connector).

6.3 PHOTOCONDUCTOR UNIT (PCU)

6.3.1 PCU



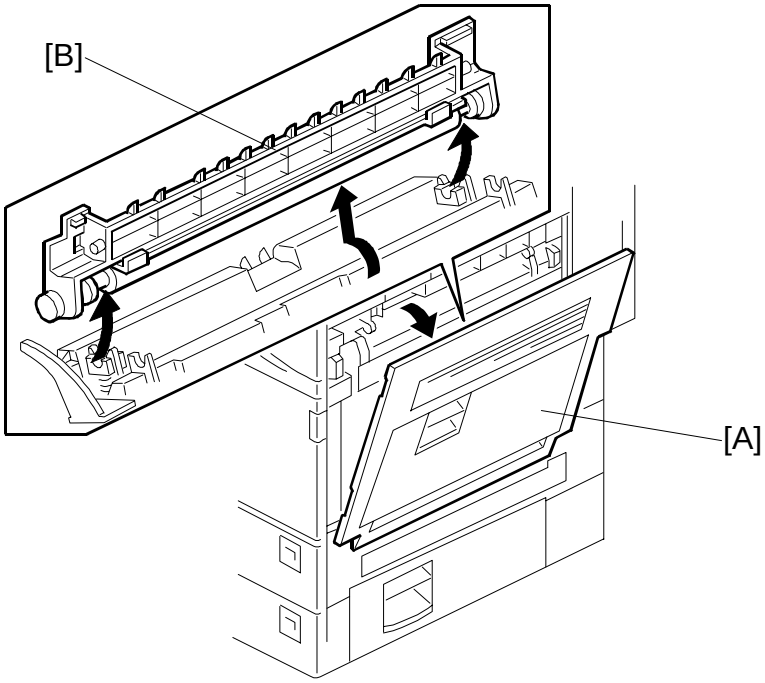
A267R203.WMF

1. Open the right cover [A] and front cover [B].
2. Pull the PCU [C] out slightly while pushing the release lever [D].

NOTE: Do not touch the drum surface with bare hands.

6.4 TRANSFER UNIT

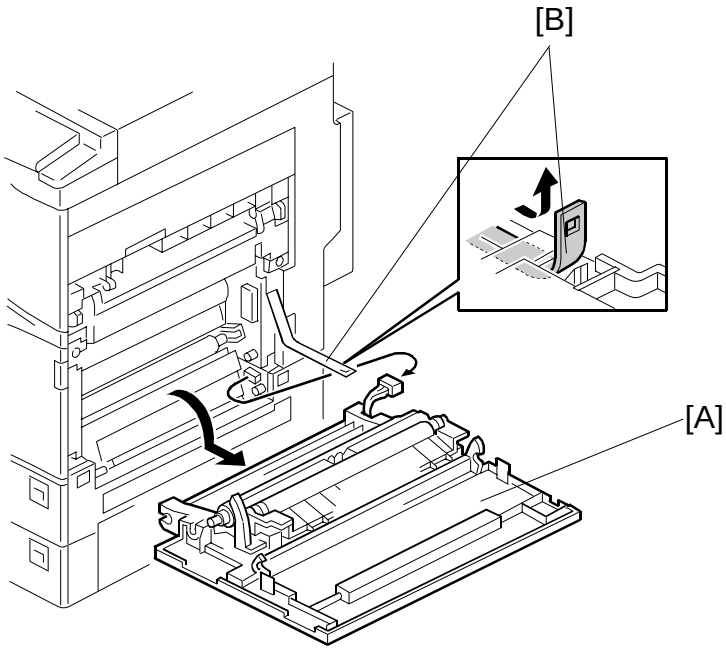
6.4.1 TRANSFER ROLLER UNIT



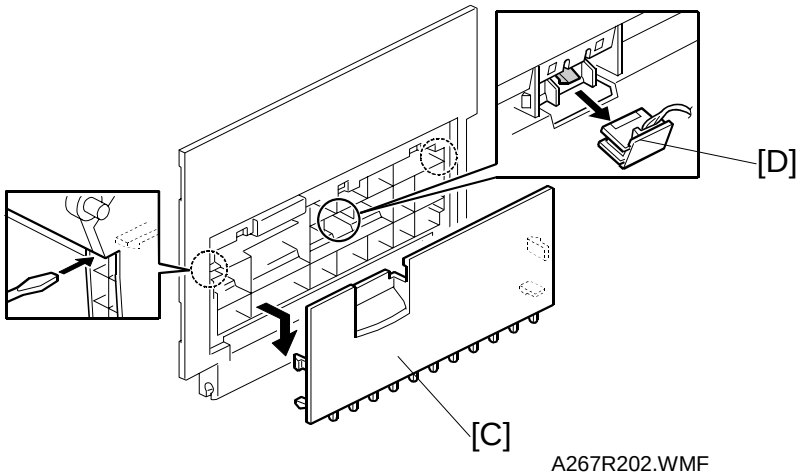
A267R401.WMF

1. Open the right cover [A].
2. Remove the transfer roller unit [B] (1 hook).
   NOTE: Do not touch the transfer roller surface.

6.4.2 IMAGE DENSITY SENSOR



A267R201.WMF



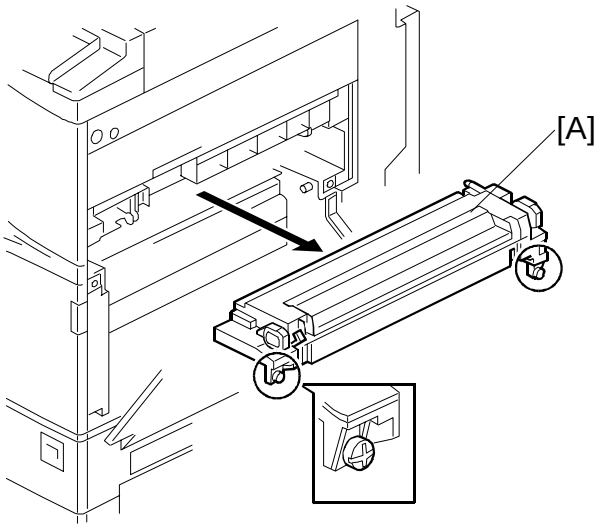
A267R202.WMF

1. Open the right cover [A].
2. Remove the unit band [B].
3. Remove the right cover [A] (1 connector),
4. Remove the sub right cover [C] (2 hooks).
5. Replace the image density sensor [D] (1 connector).
6. Reset the ID sensor error counter (SP 7-912).

6.5 FUSING/EXIT

6.5.1 FUSING UNIT

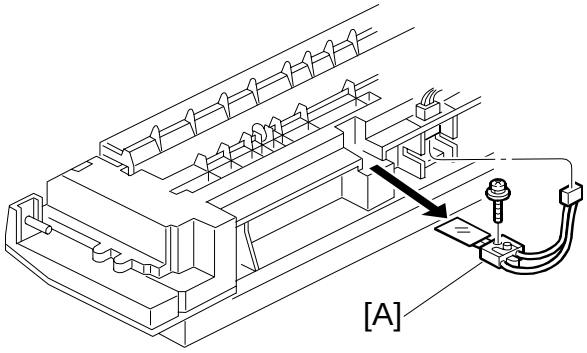
⚠CAUTION
Allow time for the unit to cool before doing the following procedure.



A267R501.WMF

1. Release the duplex unit, if it has been installed, and open the right cover.
2. Remove the fusing unit [A] (2 screws).

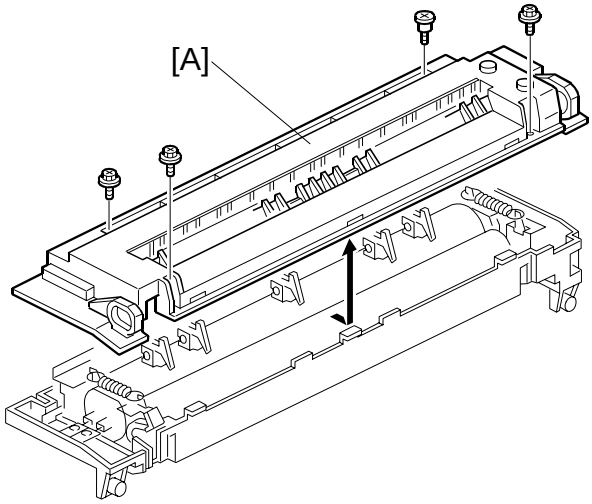
6.5.2 THERMISTOR



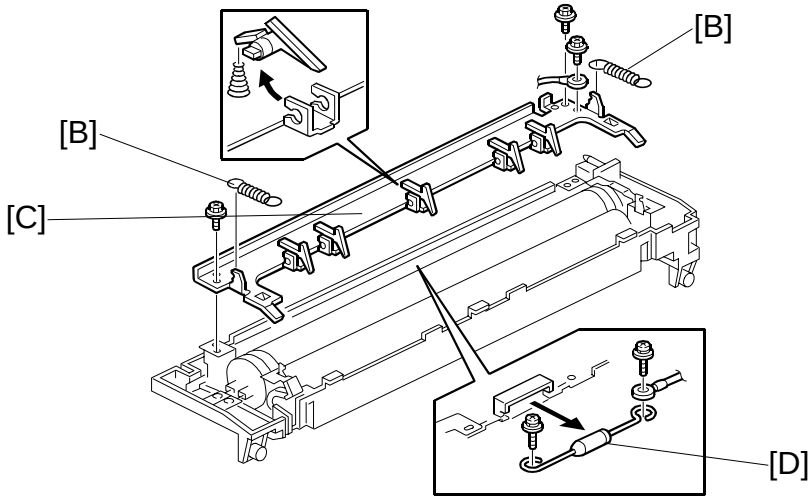
A267R502.WMF

1. Remove the fusing unit. (See Fusing Unit).
2. Replace the thermistor [A] (1 screw, 1 connector).

6.5.3 THERMOFUSE



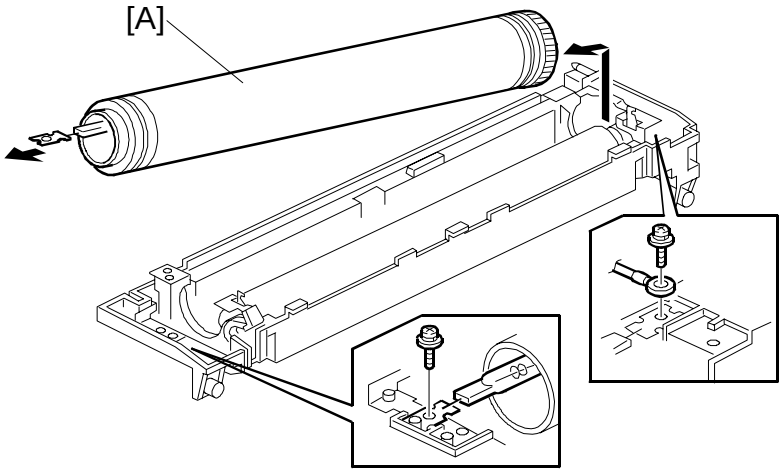
A267R507.WMF



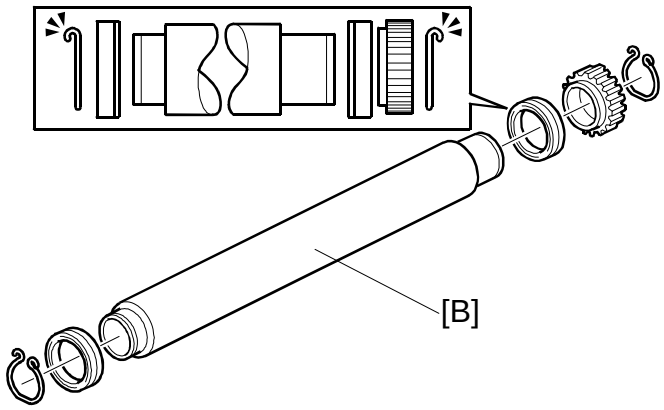
A267R504.WMF

1. Remove the fusing unit. (See Fusing Unit.)
2. Remove the fusing upper cover [A] (4 screws).
3. Remove the pressure springs [B].
4. Remove the hot roller stripper bracket [C] (3 screws).
5. Replace the thermofuse [D] (2 screws).

6.5.4 HOT ROLLER AND FUSING LAMP



A267R505.WMF

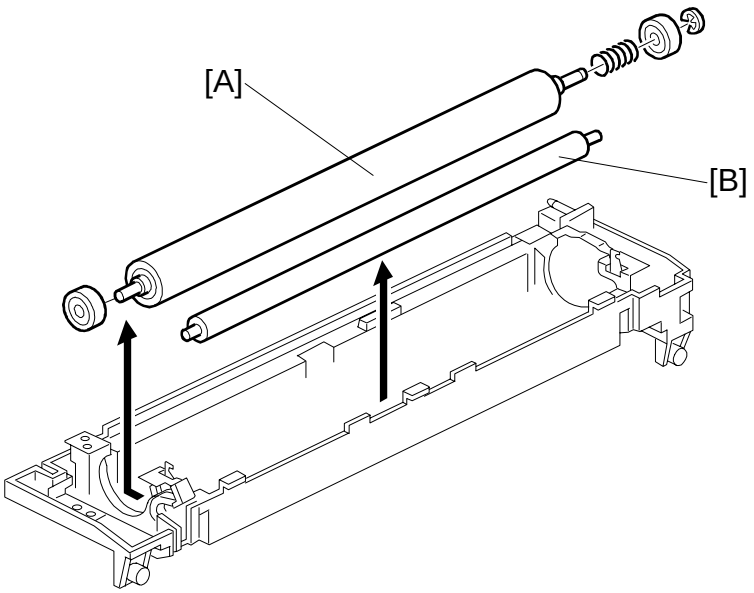


A267R506.WMF

1. Remove the fusing unit. (See Fusing Unit.)
2. Remove the fusing upper cover. (See Thermofuse.)
3. Remove the pressure springs. (See Thermofuse.)
4. Remove the hot roller stripper bracket. (See Thermofuse.)
5. Remove the fusing lamp (2 screws) and hot roller assembly [A].
   NOTE: Do not touch the surface of the fusing lamp with bare hands.
6. Replace the hot roller [B] (2 C-rings, 1 gear, 2 bushings).

   NOTE: 1) Before installing the new hot roller, peel off 3 cm (1 inch) from both ends of the protective sheet on the new roller.
   2) Do not touch the surface of the rollers.
   3) When reinstalling the fusing lamp, secure the front screws first.
   4) Be careful not to damage the surface of the hot roller.

6.5.5 PRESSURE ROLLER/CLEANING ROLLER

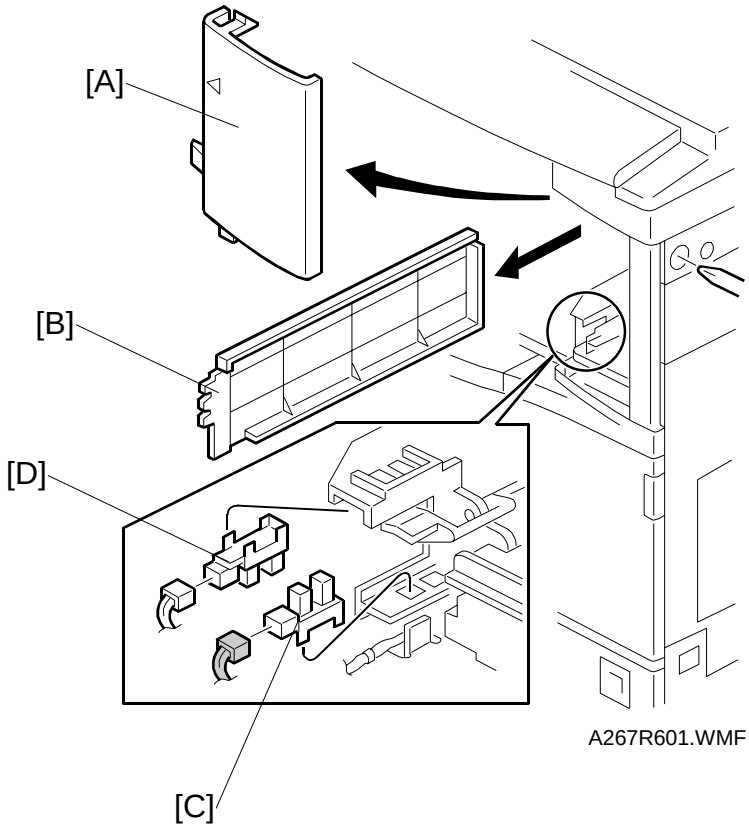


A267R507.WMF

1. Remove the fusing lamp and hot roller assembly. (See Hot Roller and Fusing Lamp.)
2. Replace the pressure roller [A] (1 E-ring, 2 bushings, 1 spring).
3. Replace the cleaning roller [B].

NOTE: Do not touch the surface of the rollers.

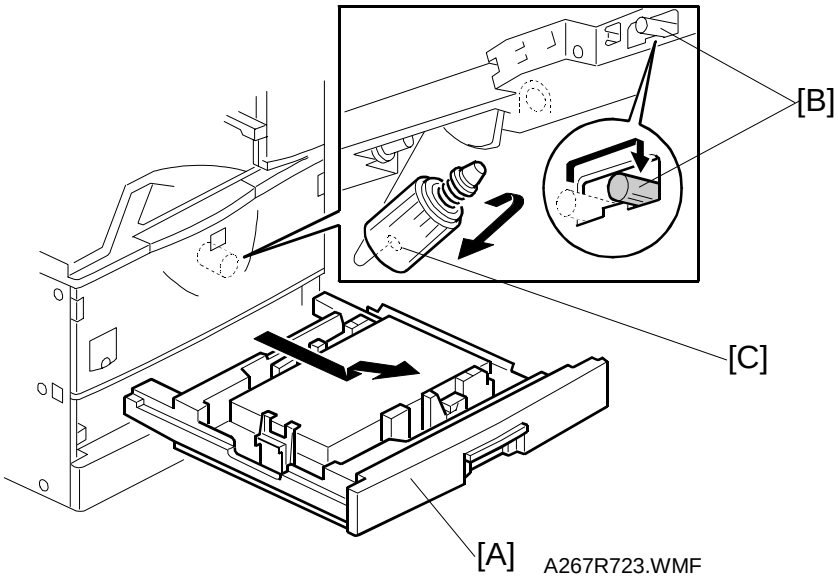
6.5.6 PAPER EXIT SENSOR/PAPER OVERFLOW SENSOR



1. Remove the front upper cover [A] (1 screw, 1 peg).
2. Remove the exit cover [B].
   NOTE: If the optional 1 bin tray unit and/or interchange unit have been installed, remove them.
3. Replace the exit sensor [C] (1 connector).
4. Replace the overflow sensor [D] (1 connector).

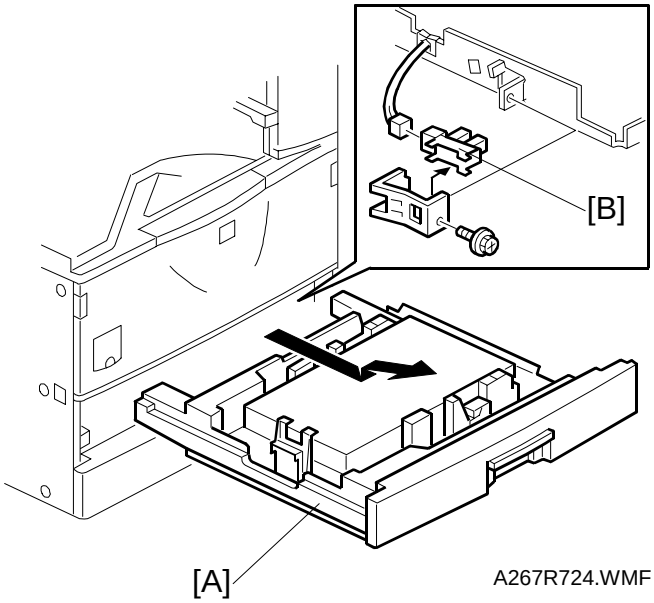
6.6 PAPER FEED

6.6.1 FEED ROLLERS



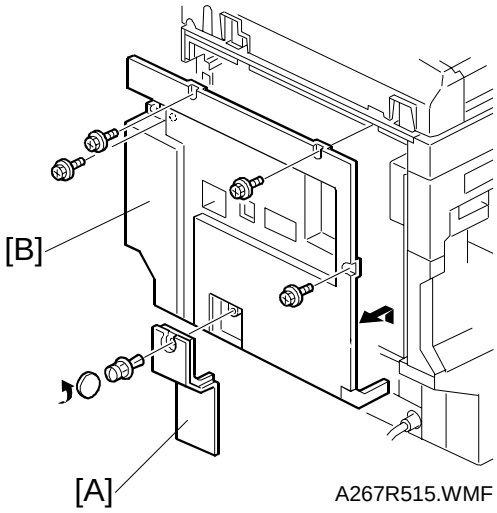
1. Remove the paper tray [A].
2. Pull the lever [B].
3. Replace the feed roller [C].
   NOTE: Do not touch the roller surface with bare hands.
   After reinstalling the feed roller, return the lever [A].

6.6.2 PAPER END SENSOR

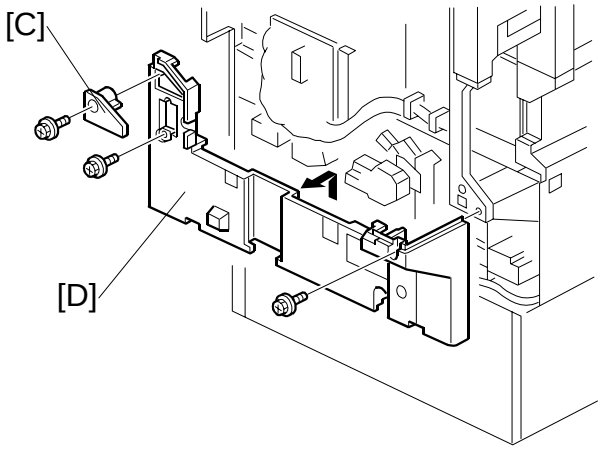


1. Remove the paper tray [A].
2. Remove the paper end sensor assembly (1 screw, 1 connector).
3. Replace the paper end sensor [B].

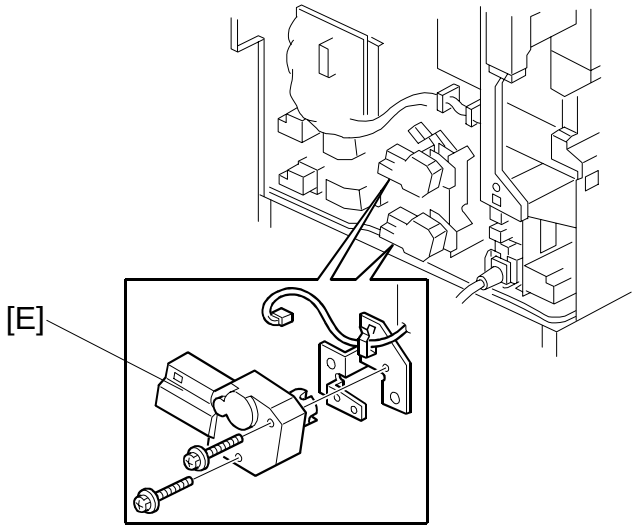
6.6.3 PAPER TRAY LIFT MOTORS



A267R515.WMF



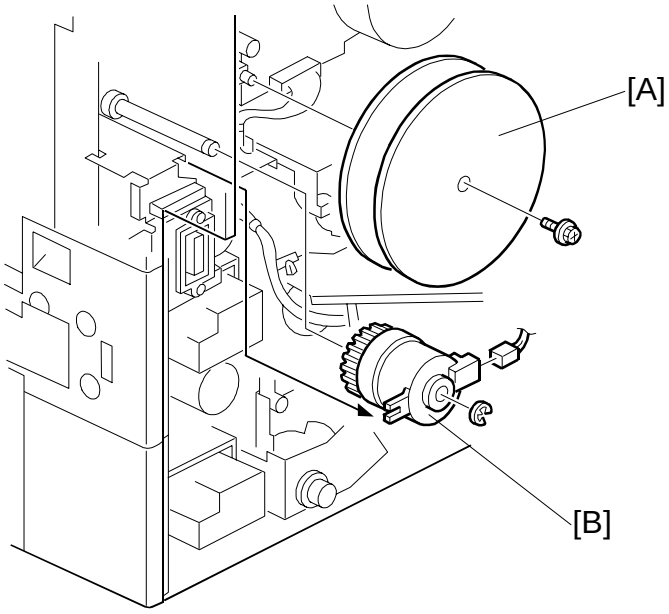
A267R705.WMF



A267R707.WMF

1. Remove the paper tray.
2. Remove the connector cover [A] (1 screw) and disconnect the cable.
3. Remove the rear cover [B] (4 screws).
4. Remove the duplex connector cover [C] (1 screw).
5. Remove the lower rear cover [D] (2 screws).
6. Replace the paper lift motors [E] (2 screws each, 1 connector each).

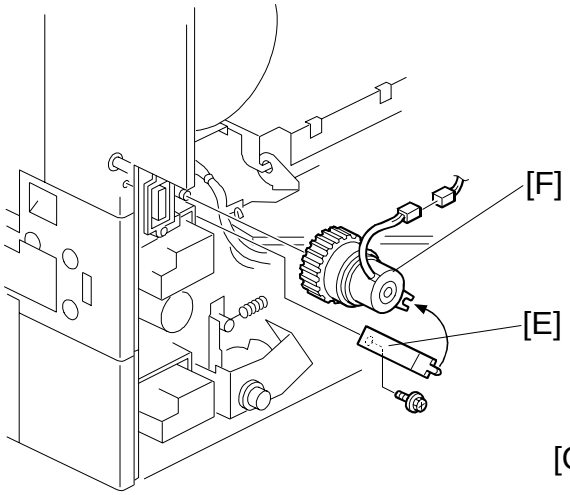
6.6.4 REGISTRATION CLUTCH



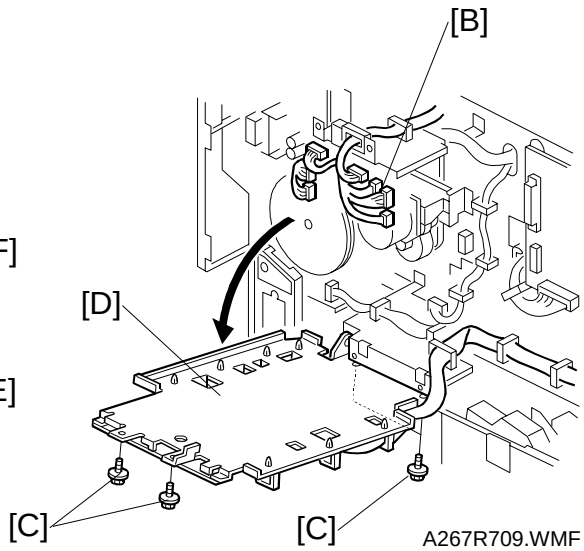
A267R712.WMF

1. Remove the connector cover and the rear cover. (See Paper Tray Lift Motors.)
2. Remove the duplex connector cover and lower rear cover. (See Paper Tray Lift Motors.)
3. Remove the fly wheels [A] (1 screw).
4. Remove the registration clutch [B] (1 E-ring, 1 connector).

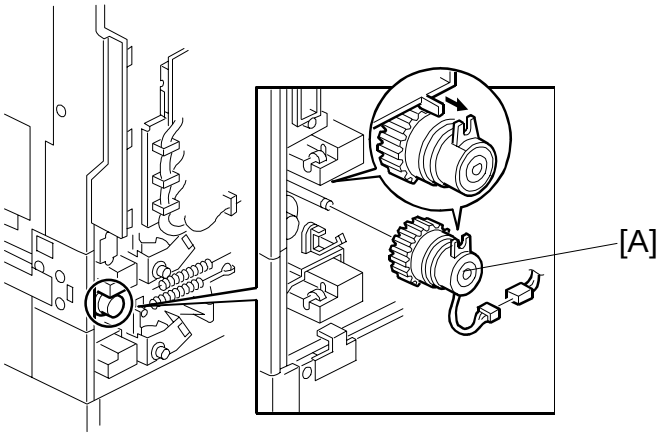
6.6.5 PAPER FEED CLUTCHES



A267R713.WMF



A267R709.WMF



A267R715.WMF

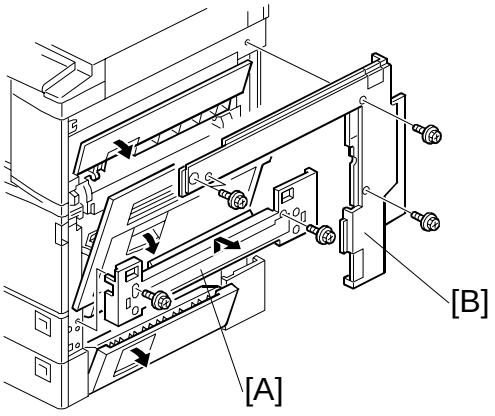
Lower Paper Feed Clutch

1. Remove the rear cover. (See Paper Tray Lift Motors.)
2. Remove the lower rear cover. (See Paper Tray Lift Motors.)
3. Replace the lower paper feed clutch [A] (1 connector).

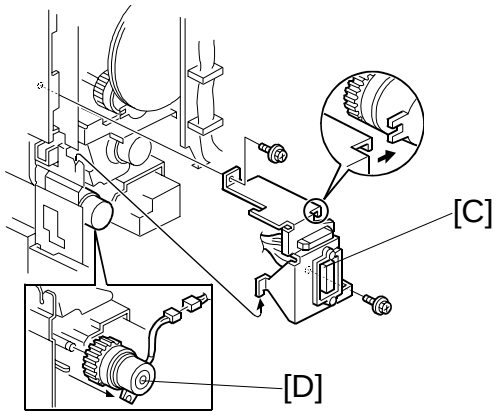
Upper Paper Feed Clutch.

4. Disconnect the connectors [B] for the I/O board as shown (11 connectors).
5. Remove 4 screws [C] securing the I/O board bracket then swing down the I/O board bracket [D].
6. Remove the bracket [E] (1 screw).
7. Replace the upper paper feed clutch [F] (1 connector).

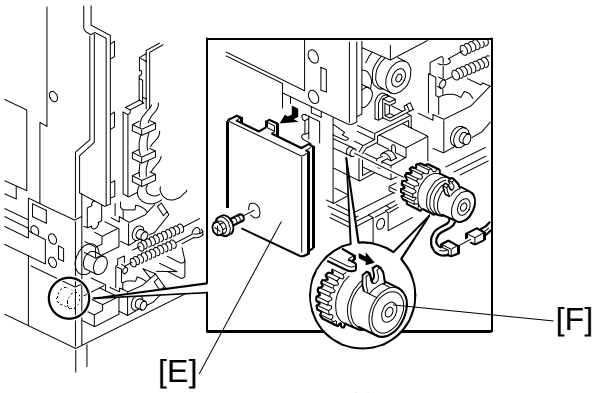
6.6.6 RELAY CLUTCHES



A267R716.WMF



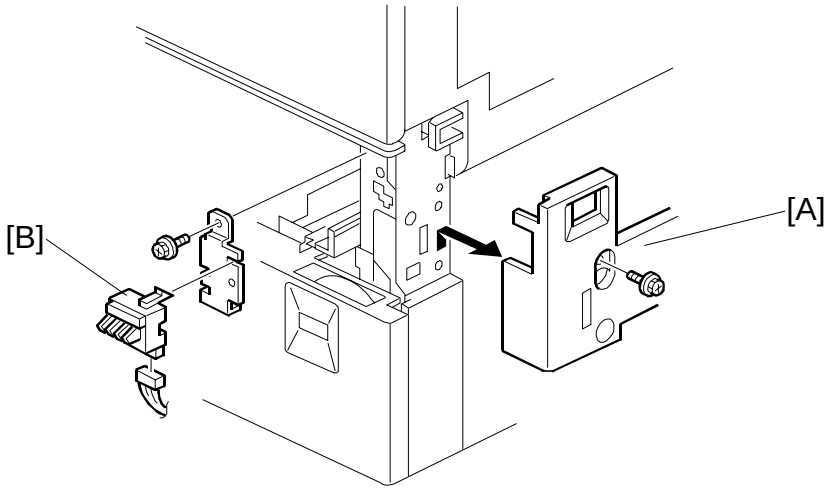
A267R717.WMF



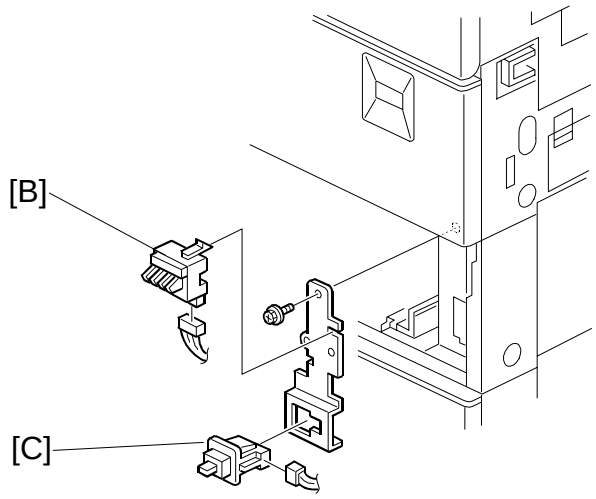
A267R714.WMF

1. Remove the optional duplex unit and/or by-pass tray unit if they have been installed.
2. Remove the rear cover and lower rear cover. (See Paper Tray Lift Motors.)
3. Remove the lower right cover [A] (2 screws).
4. Remove the scanner right cover. (See Scanner Exterior.)
5. Remove the right cover [B] (4 screws).
6. Swing down the I/O board bracket. (See Paper Feed Clutches.)
7. Remove the connector bracket [C] (2 screws).
8. Replace the upper relay clutch [D] (1 connector).
9. Remove the right back cover [E] (1 screw).
10. Replace the lower relay clutch [F] (1 connector).

6.6.7 PAPER SIZE DETECTOR/SPECIAL PAPER SENSOR



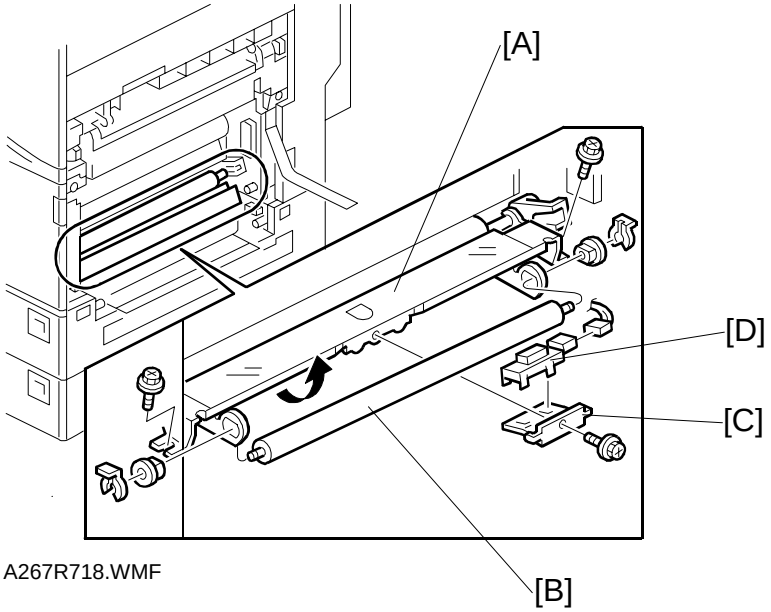
A267R721.WMF



A267R722.WMF

1. Remove the right lower cover [A]. (See Relay Clutches.)
2. Remove the paper trays.
3. Remove the paper size detector assembly (1 screw each).
4. Replace the paper size detectors [B] (1 connector each) and the special paper sensor [C] (1 connector).

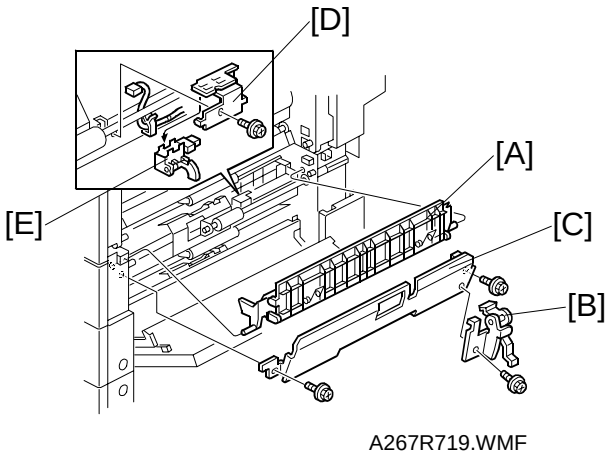
6.6.8 REGISTRATION SENSOR



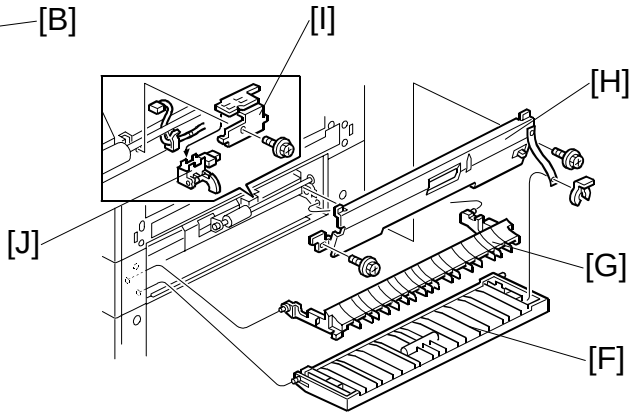
A267R718.WMF

1. Remove the right cover. (See Image Density Sensor.)
2. Remove the registration guide plate [A] (2 screws).
3. Remove the paper support roller [B] (2 snap rings, 2 bushings).
4. Remove the sensor bracket [C] (1 screw).
5. Replace the registration sensor [D] (1 connector).

6.6.9 RELAY SENSORS



A267R719.WMF



A267R720.WMF

Upper Relay Sensor

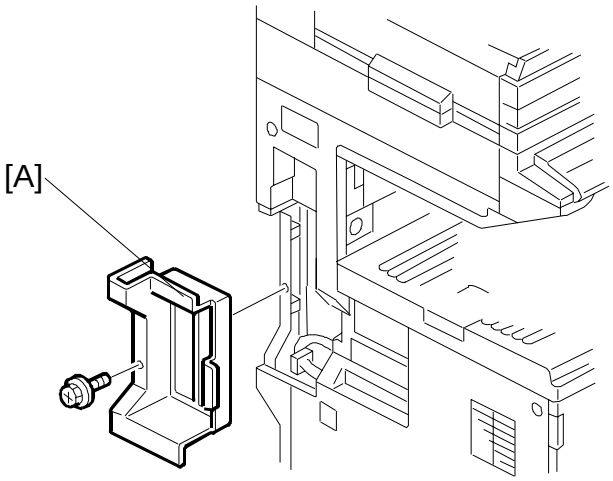
1. Remove the right cover. (See Image Density Sensor.)
2. Remove the lower right cover. (See Relay Clutches.)
3. Remove the guide plate [A].
4. Remove the bracket [B] (1 screw).
5. Remove the guide plate [C] (2 screws).
6. Remove the sensor bracket [D] (1 screw).
7. Replace the upper relay sensor [E] (1 connector).

Lower Relay Sensor

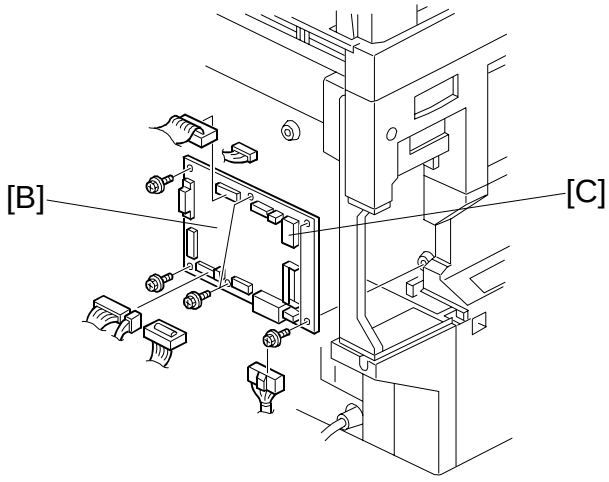
1. Remove the right lower door [F] (1 clip).
2. Remove the guide plate [G].
3. Remove the guide plate [H] (2 screws).
4. Remove the sensor bracket [I] (1 screw).
5. Replace the lower relay sensor [J] (1 connector).

6.7 PCBS AND OTHER ITEMS

6.7.1 BICU BOARD



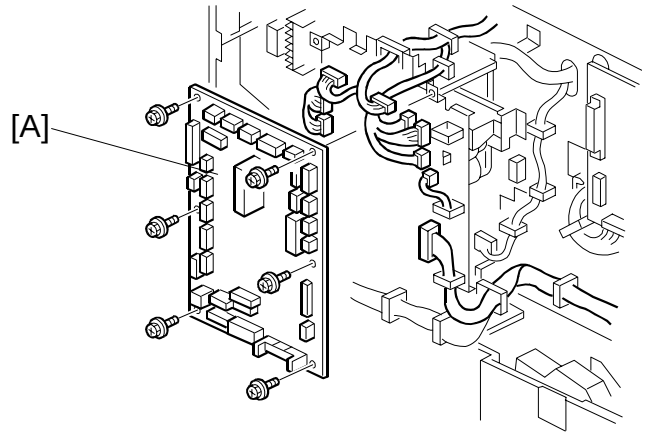
A267R517.WMF



A267R516.WMF

1. Remove the rear cover. (See Paper Tray Lift Motors.)
2. Remove the optional finisher if it has been installed.
3. Remove the application cover [A] (1 screw).
4. Remove the expansion box if the fax, printer, or scanner option units have been installed.
5. Remove the optional copier memory if it has been installed.
6. Remove the BICU board [B] (6 connectors, 6 screws or 5 screws if the optional copier memory has been installed).
7. Remove the NVRAM [C] from the old BICU board and put it on the new BICU board.

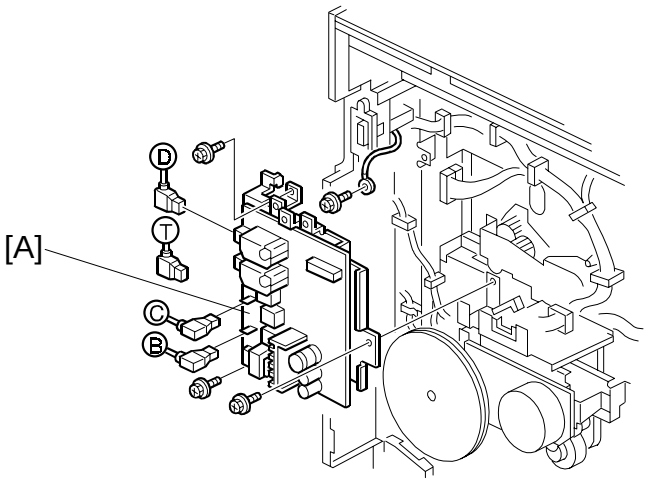
6.7.2 I/O BOARD



A267R708.WMF

1. Remove the rear cover. (See Paper Tray Lift Motors.)
2. Remove the I/O board [A] (All connectors, 6 screws).

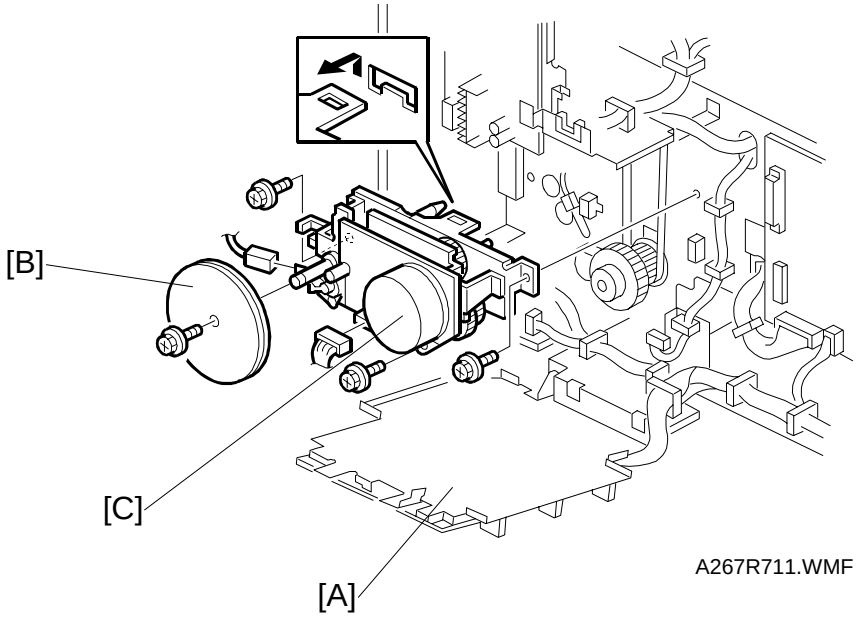
6.7.3 POWER PACK



A267R710.WMF

1. Remove the rear cover. (See Paper Tray Lift Motors.)
2. Swing down the I/O board bracket. (See Paper Feed Clutches.)
3. Remove the power pack [A] (5 connectors, 4 screws).

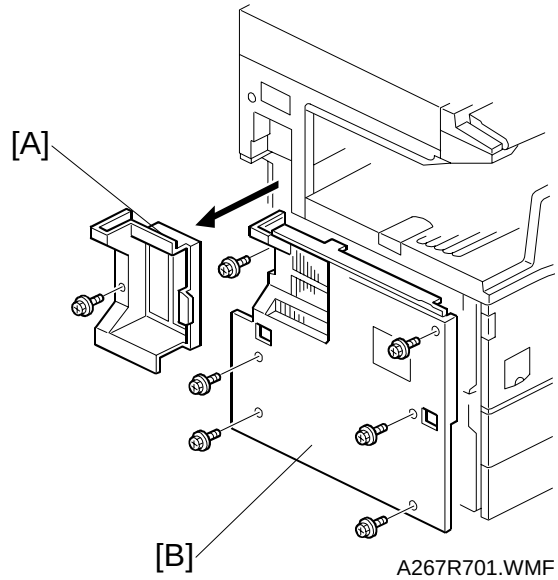
6.7.4 MAIN MOTOR



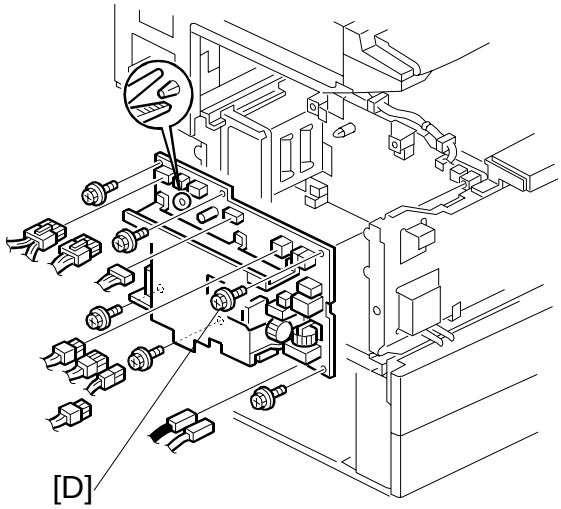
1. Remove the rear cover. (See Paper Tray Lift Motors.)
2. Swing down the I/O board bracket [A]. (See Paper Feed Clutches.)
3. Remove the fly wheels [B] (1 screw).
4. Replace the main motor [C] (2 connectors, 3 screws).

6.7.5 PSU

– 115 V Machine –

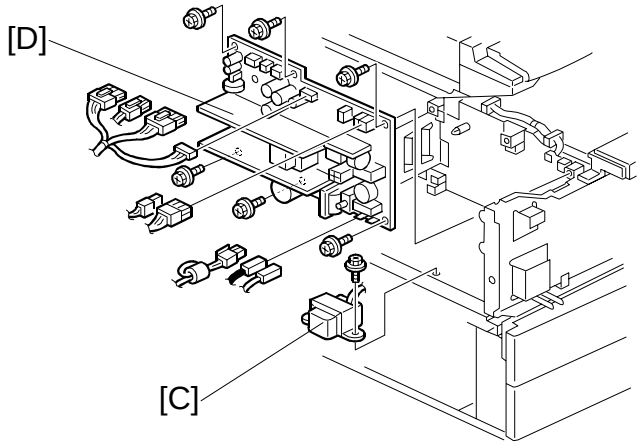


A267R701.WMF



A267R702.WMF

– 220 V machine –



A267R726.WMF

1. Remove the optional finisher if it has been installed.
2. Remove the application cover [A] (1 screw).
3. Remove the left cover [B] (6 screws).
4. **220 V machine only:** Remove the transformer [C] (1 screw).
5. Remove the PSU [D] (all connectors, 6 screws, 1 clip).

6.8 COPY ADJUSTMENTS: PRINTING/SCANNING

NOTE: 1) You need to perform these adjustment(s) after replacing any of the following parts:
- Scanner Wire
- Lens Block/SBU Assembly
- Scanner Drive Motor
- Polygon Mirror Motor
- Paper Side Fence
- Memory All Clear

2) For more details about accessing SP modes, refer to section 4.

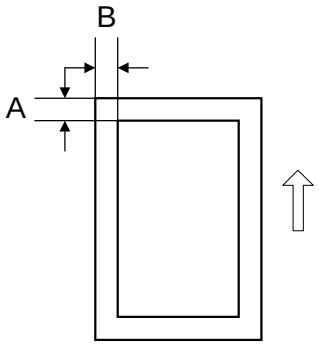
6.8.1 PRINTING

NOTE: 1) Make sure the paper is installed correctly in each paper tray before you start these adjustments.
2) Use the Trimming Area Pattern (SP5-902-3, No.10) to print the test pattern for the following procedures.
3) Set SP 5-902-3 to 0 again after completing these printing adjustments.

Registration - Leading Edge/Side-to-Side

1. Check the leading edge registration for each paper feed station, and adjust them using SP1-001.
2. Check the side-to-side registration for each paper feed station, and adjust them using SP1-002.

Tray	SP mode	Specification
Any paper tray	SP1-001-1	3 ± 2 mm
By-pass feed	SP1-001-2	
Duplex	SP1-001-3	
1st paper feed	SP1-002-1	2 ± 1.5 mm
2nd paper feed	SP1-002-2	
3rd paper feed (Optional PFU tray 1), or LCT	SP1-002-3	
4th paper feed (Optional PFU tray 2)	SP1-002-4	
By-pass feed	SP1-002-5	
Duplex	SP1-002-6	



A267R508.WMF

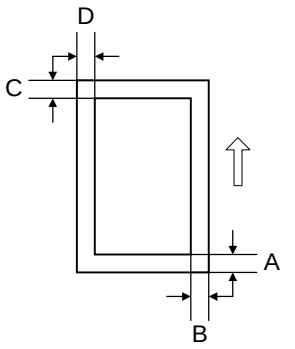
A: Leading Edge Registration
B: Side-to-side Registration

Blank Margin

NOTE: If the leading edge/side-to-side registration cannot be adjusted within the specifications, adjust the leading/left side edge blank margin.

1. Check the trailing edge and right side edge blank margins, and adjust them using the following SP modes.

	SP mode	Specification
Trailing edge	SP2-101-2/3/4	3 ± 2 mm
Right edge	SP2-101-6	2 +2.5/-1.5 mm
Leading edge	SP2-101-1	3 ± 2 mm
Left edge	SP2-101-5	2 ± 1.5 mm
Trailing edge (duplex copy, 2nd side)	SP2-101-7	2 ± 2 mm
Left edge (duplex copy, 2nd side)	SP2-101-8	2 ± 1.5 mm
Right edge (duplex copy, 2nd side)	SP2-101-9	2 +2.5/-1.5 mm



A267R509.WMF

A: Trailing Edge Blank Margin
B: Right Edge Blank Margin
C: Leading Edge Blank Margin
D: Left Edge Blank Margin

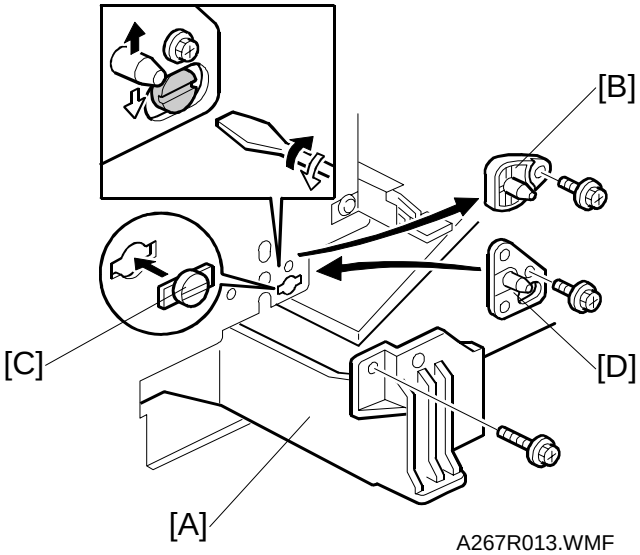
Main Scan Magnification

1. Print the single-dot grid pattern (SP5-902, no.5).
2. Check the magnification, and adjust the magnification using SP2-998-1 if necessary. The specification is ± 1%.

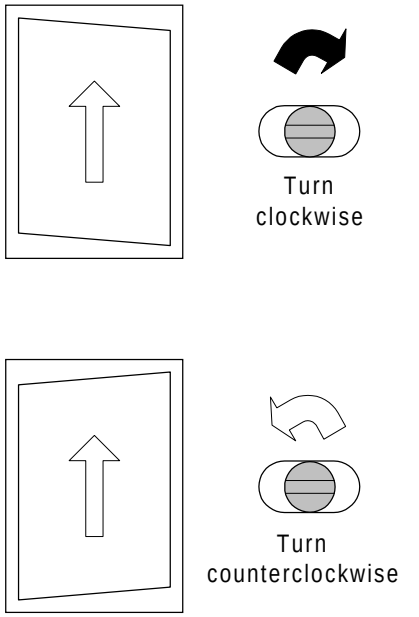
Parallelogram Image Adjustment

Do the following procedure if a parallelogram is printed while adjusting the printing registration or the printing margin using a trimming area pattern.

NOTE: The following procedure should be done after adjusting the side-to-side registration for each paper tray station.



A267R013.WMF



A267R510.WMF

1. Check whether the trimming area pattern (SP5-902, No.10) is printed as a parallelogram, as shown. If it is, do the following.
2. Remove the laser unit [A] (see Laser Unit).
3. Remove the bracket [B] (2 screws).
4. Install the adjusting cam [C] (P/N: A2309003).
5. Secure the adjustment bracket [D] (P/N A2679002) using the screw which was used for bracket [B]. However, do not tighten the screws at this time.
6. Adjusts the laser unit position by turning the adjusting cam. (Refer to the above illustration for the relationship between the image and the cam rotation direction).
7. Tighten the adjustment bracket.
8. Print the trimming area pattern to check the image. If it is still unsatisfactory, repeat steps 4 to 8.

6.8.2 SCANNING

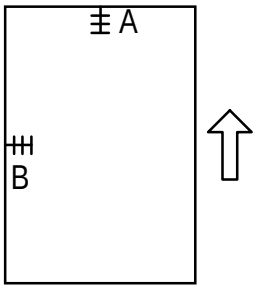
NOTE: 1) Before doing the following scanner adjustments, perform or check the printing registration/side-to-side adjustment and the blank margin adjustment.
2) Use an OS-A3 test chart to perform the following adjustments.

Registration: Platen Mode

1. Place the test chart on the exposure glass and make a copy from one of the feed stations.
2. Check the leading edge and side-to-side registration, and adjust them using the following SP modes if necessary.

	SP mode
Leading Edge	SP4-010
Side-to-side	SP4-011

A: Leading Edge Registration
B: Side-to-side Registration



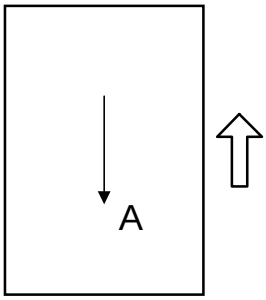
A267R511.WMF

Magnification

NOTE: Use an OS-A3 test chart to perform the following adjustment.

Sub Scan Magnification

A: Sub Scan Magnification



A267R512.WMF

1. Place the test chart on the exposure glass and make a copy from one of the feed stations.
2. Check the magnification ratio, and adjust it using the following SP mode if necessary. The specification is ±1%.

	SP mode
Sub Scan Magnification	SP4-008

Standard White Density Adjustment

This adjusts the standard white density level.

Perform this adjustment in any of the following conditions:

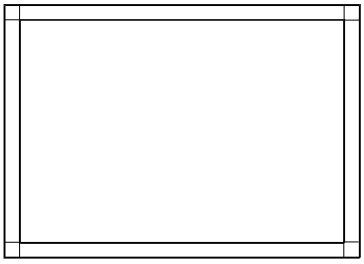
- After replacing the standard white plate.
- After replacing the NVRAM on the BICU board. (If only BICU board is replaced, this adjustment is not necessary, as the NVRAM from the old BICU is put on the new BICU.)
- After performing a memory all clear (SP5-801).

Procedure:

1. Place 10 sheets of new A4 sideways (do not use any recycled paper) or A3 paper on the exposure glass and close the platen cover or the ADF.
2. Enter SP 4-908 and select “1: Yes”. The standard white density is automatically adjusted.

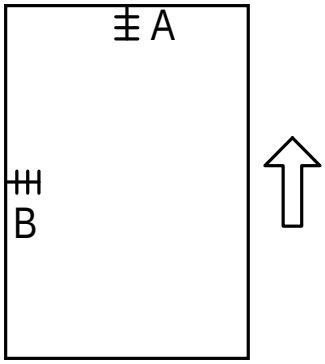
6.8.3 ADF IMAGE ADJUSTMENT

Registration



A267R514.WMF

A: Leading Edge Registration
B: Side-to-side Registration



A267R513.WMF

NOTE: Make a temporary test chart as shown above using A3/DLT paper.

1. Place the temporary test chart on the ADF and make a copy from one of the feed stations.
2. Check the registration, and adjust using the following SP modes if necessary.

	SP mode
Side-to-side Registration	SP6-006-1
Leading Edge Registration (Simplex)	SP6-006-2
Trailing Edge Blank Margin	SP6-006-3
Side-to-side Registration (Duplex: rear)	SP6-006-4

7. TROUBLESHOOTING

7.1 SERVICE CALL CONDITIONS

7.1.1 SUMMARY

There are 4 levels of service call conditions.

Level	Definition	Reset Procedure
A	To prevent the machine from being damaged, the SC can only be reset by a service representative. The copier cannot be operated at all.	Enter SP 5-810 (SC code reset) and select "1". Then hold down the Photo mode key and the # key at the same time for at least 3 seconds (this does not require the main switch to be turned off and on).
B	The SC can be reset by turning the operation switch off and on if the SC was caused by a sensor error.	Turn the operation switch or main power switch off and on.
B'	The SC can be reset by turning the main power switch off and on if the SC was caused by a communication error.	Turn the main power switch off and on.
C	The copier can be operated as usual except for the unit related to the service call.	Turn the operation switch off and on.

NOTE: 1) If the problem concerns electrical circuit boards, first disconnect then reconnect the connectors before replacing the PCBs.
2) If the problem concerns a motor lock, first check the mechanical load before replacing motors or sensors.
3) When a Level A or B SC occurs while in an SP mode, the display does not indicate the SC number. If this occurs, check the SC number after leaving the SP mode. This does not apply to level B' codes.

7.1.2 SC CODE DESCRIPTIONS

SC101: Exposure lamp error

-Definition- [B]

The standard while level was not detected properly when scanning the white plate.

- Possible causes -

- Exposure lamp defective
- Exposure lamp stabilizer defective
- Exposure lamp connector defective
- Dirty scanner mirror or scanner mirror out of position
- SBU board defective
- SBU connector defective
- Lens block out of position

SC120: Scanner home position error 1

-Definition- [B]

The scanner home position sensor does not detect the off condition during initialization or copying.

- Possible causes -

- Scanner home position sensor defective
- Scanner drive motor defective
- Scanner home position sensor connector defective
- Scanner drive motor connector defective
- IOB board defective

SC121: Scanner home position error 2

-Definition- [B]

The scanner home position sensor does not detect the on condition during initialization or copying.

- Possible causes -

- Scanner home position sensor defective
- Scanner drive motor defective
- Scanner home position sensor connector defective
- Scanner drive motor connector defective
- IOB board defective

SC122: Scanner home position error 3

-Definition- [B]

The scanner home position sensor detects the on condition while the scanner is returning to the home position.

- Possible causes -

- Scanner home position sensor defective
- Scanner drive motor defective
- Scanner home position sensor connector defective
- Scanner drive motor connector defective
- IOB board defective

SC123: Scanner home position error 4

-Definition- [B]

The scanner home position sensor does not detect the on condition after the scanner returns to the home position.

- Possible causes -

- Scanner home position sensor defective
- Scanner drive motor defective
- Scanner home position sensor connector defective
- Scanner drive motor connector defective
- IOB board defective

SC192: Automatic SBU adjustment error

-Definition- [B]

An error is detected during automatic SBU adjustment (SP4-903)

- Possible causes -

- SBU defective
- BICU board defective
- Exposure lamp stabilizer defective
- Exposure lamp defective
- Dirty white plate

SC194: IPU White Level Detection Error

Definition: [B]

The level of the white standard pattern detected by the IPU chip (on the BICU board) is too low.

Possible Causes:

- Exposure lamp defective
- BICU board defective
- Incorrect position of the white standard pattern
- Dirty white plate
- SBU board defective

SC302: Charge roller current leak

-Definition- [B]

A charge roller current leak signal is detected.

- Possible causes -

- Charge roller damaged
- Charge high voltage supply board defective
- Poor connection of the PCU

SC320: Polygon motor error

-Definition- [B]

The polygon motor does not reach its operating speed within 10 seconds after the polygon motor on signal, or the lock signal is not detected for more than 200 ms continuously during operation.

- Possible causes -

- Polygon mirror motor defective
- Poor connection between the polygon mirror motor driver and the BICU board
- BICU board defective

SC321: No laser writing signal (F-GATE) error

Definition: [B]

The laser writing signal (F-GATE) is still not LOW when the laser writing area +5 mm has passed since the laser writing start position on the drum.

Possible Causes:

- BICU board defective
- EMB (Copier feature expander) board defective
- The fax controller or printer controller has a poor connection.
- Fax controller or printer controller defective

SC322: Laser synchronization error

-Definition- [B]

The main scan synchronization detector board cannot detect the laser synchronization signal for more than 5 consecutive 100 ms intervals.

- Possible causes -

- Poor connection between the laser synchronization detector board and the BICU board
- Laser synchronization detector board out of position
- Laser synchronization detector board defective
- BICU board defective
- LD unit defective

SC324: LD drive current over

-Definition- [B]

The LD drive board applies more than 100 mA to the LD.

- Possible causes -

- LD unit defective (not enough power, due to aging)
- Poor connection between the LD unit and the BICU board
- BICU board defective

SC390: TD sensor error

-Definition- [B]

The TD sensor outputs less than 0.5V or more than 4.0V 10 times consecutively during copying.

- Possible causes -

- TD sensor abnormal
- Poor connection of the PCU

SC391: Development bias leak

-Definition- [B]

A development bias leak signal is detected.

- Possible causes -

- Poor connection of the PCU
- High voltage supply board defective

SC392: TD sensor initial setting error

-Definition- [B]

TD sensor output voltage falls out of the adjustment range (2.0 ±<> 0.2 V) after the TD sensor initial setting has been finished.

- Possible causes -

- Someone forgot to remove the toner seal of the PCU
- ID sensor defective
- TD sensor abnormal
- Drum does not turn
- Development roller does not turn
- Poor connection of the PCU

SC401: Transfer roller leak error 1
SC402: Transfer roller leak error 2

-Definition- [B]

A transfer roller current leak signal is detected.
The current feedback signal for the transfer roller is not detected.

- Possible causes -

- High voltage supply board defective
- Poor connection of the PCU
- Transfer/separation unit set incorrectly
- Transfer roller damaged

SC411: Separation bias leak error

-Definition- [B]

A separation bias leak signal is detected.

- Possible causes -

- High voltage supply board defective
- Poor connection of the PCU
- Discharge plate defective

SC500: Main motor lock

-Definition- [B]

A main motor lock signal is not detected for more than 500 ms after the main motor starts to rotate, or the lock signal is not detected for more than 500 ms during rotation after the last signal.

- Possible causes -

- Too much load on the drive mechanism
- Main motor defective

SC501: 1st paper tray lift motor malfunction
SC502: 2nd paper tray lift motor malfunction
SC503: 3rd paper tray lift motor malfunction (optional paper tray unit)
SC504: 4th paper tray lift motor malfunction (optional paper tray unit)

-Definition- [C]

The paper lift sensor is not activated after the tray lift motor has been on for 18 seconds.

- Possible causes -

- Paper lift sensor defective
- Tray lift motor defective
- Too much load on the drive mechanism
- Poor tray lift motor connection

SC506: Paper tray motor lock (optional paper tray unit)

-Definition- [C]

A motor lock signal is not detected for more than 1.5 s or the lock signal is not detected for more than 1.0 s during rotation.

- Possible causes -

- Paper tray unit motor defective
- Too much load on the drive mechanism

SC507: Tandem tray lift error (optional LCT)

-Definition- [C]

The lower limit sensor is not activated after the paper tray lift motor has been on to lower the tandem tray for 8 seconds.

- Possible causes -

- Paper tray lift motor defective
- Lower limit sensor defective
- Too much load on the drive mechanism

SC508: Rear fence drive error (optional LCT)

-Definition- [C]

The return position sensor is not activated after the rear fence drive motor has been on to lower the tandem tray for 8 seconds.

- Possible causes -

- Rear fence motor defective
- Return position sensor defective
- Too much load on the drive mechanism

SC509: Side fence drive error (optional LCT)

-Definition- [C]

The side fence positioning sensor is not activated for more 3 seconds when the paper stack in the left tray is moved to the right tray.

The side fence close sensor is not activated for more 3 seconds after moving the paper stack to the right tray.

- Possible causes -

- Side fence motor defective
- Side fence position sensor defective
- Side fence close sensor defective
- Too much load on the drive mechanism

SC541: Fusing thermistor open

-Definition- [A]

The fusing temperature detected by the thermistor was below 55 °C for 15 seconds or below 75 °C for 20 seconds.

- Possible causes -

- Fusing thermistor defective or out of position
- Fusing lamp open
- Fusing thermofuse open
- Power supply board defective
- Poor connection of the fusing unit

SC542: Fusing temperature warm-up error

-Definition- [A]

The fusing temperature does not reach 155 °C within 60 seconds after the main switch is turned on.

- Possible causes -

- Fusing thermistor defective or out of position
- Fusing lamp open
- Fusing thermofuse open
- Power supply board defective
- Poor connection of the fusing unit

SC543: Fusing overheat error

-Definition- [A]

A fusing temperature of over 231°C is detected for 1 second by the fusing thermistor.

- Possible causes -

- Fusing thermistor defective
- Power supply board defective

SC544: Fusing low temperature error

-Definition- [A]

A fusing temperature of lower than 100°C is detected for 1 second by the fusing thermistor.

- Possible causes -

- Fusing thermistor defective
- Power supply board defective
- Poor connection of the fusing unit

SC546: Unstable fusing temperature

Definition: [A]

Fusing temperature more than 60 °C: The fusing temperature does not rise 2°C or more within 6 seconds after the fusing lamp has been on.

Fusing temperature 60 °C or less: The fusing temperature does not rise 2°C or more during a 6 second interval (the 6 s timer starts 14 s after the fusing lamp turned on).

Possible Causes:

- Thermistor defective
- Poor connection of the fusing unit
- Power supply unit defective

SC547: Zero cross signal malfunction

-Definition- [A]

Zero cross signals are not detected within a certain period.

- Possible causes -

- Power supply board defective
- IOB defective
- BICU defective

SC590: Exhaust fan motor error

-Definition- [B]

The CPU detects an exhaust fan lock signal for more than 3.5 seconds.

- Possible causes -

- Poor connection of the exhaust fan motor
- Too much load on the motor drive

SC610: Communication error between IOB and duplex unit

-Definition- [B']

The IOB cannot communicate with the duplex unit properly.

- Possible causes -

- Poor connection between the IOB and duplex unit
- IOB defective
- Duplex control board defective

SC620: Communication error between IOB and ADF

Definition: [B]

The IOB cannot receive a response from the ADF main board for 4 seconds or more.

Possible Causes:

- Poor connection between the IOB and ADF main board (DF connector)
- ADF main board defective
- IOB defective

SC691: Communication error between BICU and fax controller

-Definition- [B]

The BICU board cannot communicate with the fax controller properly.

- Possible causes -

- Poor connection between the BICU board and the fax controller
- BICU board defective
- Fax controller defective

SC692: Communication error between BICU and printer controller

-Definition- [B]

The BICU board cannot communicate with the printer controller properly.

- Possible causes -

- Poor connection between the BICU board and the mother board.
- Poor connection between the mother board and the printer controller
- BICU board defective
- Printer controller defective
- Mother board defective

SC694: Communication error between BICU and scanner controller

-Definition- [B]

The BICU board cannot communicate with the scanner controller properly.

- Possible causes -

- Poor connection between the BICU board and the mother board.
- Poor connection between the mother board and the scanner controller
- BICU board defective
- Scanner controller defective
- Mother board defective

SC 696: Communication error between IOB and finisher

-Definition- [B']

The IOB cannot communicate with the finisher properly.

- Possible causes -

- Poor connection between the IOB and finisher
- IOB defective
- Finisher main board defective

SC722: Finisher jogger motor error

-Definition- [B']

1) The finisher jogger H.P sensor remains de-activated for a certain time when returning to home position.
2) The finisher jogger H.P sensor remains activated for a certain time when moving away from home position.

- Possible causes -

- Jogger H.P sensor defective
- Jogger motor defective

SC725: Finisher stack feed-out motor error

- Definition - [B']

The stack feed-out belt H.P sensor does not activate within a certain time after the stack feed-out motor turned on.

- Possible causes -

- Stack feed-out H.P sensor defective
- Stack feed-out motor defective

SC726: Finisher shift motor error

- Definition - [B']

Tray shift does not finish within a certain time after the shift motor turned on.

- Possible causes -

- Shift motor defective
- Shift tray half-turn sensor defective

SC730: Finisher stapler position motor error

- Definition - [B']

1) The stapler does not return to its home position within a certain time after the stapler motor turned on.
2) The stapler H.P sensor does not activate within a certain time after the stapler motor turned on.

- Possible causes -

- Stapler motor defective
- Stapler H.P sensor defective
- Poor stapler motor connection

SC733: Finisher stack feed-out motor error

- Definition - [B']

The stack feed-out belt H.P sensor does not activate within a certain time after the stack feed-out motor turned on.

- Possible causes -

- Stack feed-out H.P sensor defective
- Stack feed-out motor defective

SC734: Finisher lift motor error

- Definition - [B']

The stack height sensor does not activate within a certain time after the shift tray lift motor turned on.

- Possible causes -

- Shift tray lift motor defective
- Stack height sensor defective

SC735: Finisher exit guide plate motor error

- Definition - [B']

The exit guide plate open sensor or exit guide plate HP sensor does not activate within a certain time after the exit guide plate motor turned on.

- Possible causes -

- Exit guide plate motor defective
- Exit guide plate HP sensor defective
- Exit guide plate open sensor defective

SC 750: Interchange unit connection error

-Definition- [B']

The IOB cannot communicate with the interchange unit properly when the duplex unit is installed.

- Possible causes -

- Poor connection between the IOB and interchange unit
- IOB defective

SC 751: Bridge unit connection error

-Definition- [B']

The IOB cannot communicate with the bridge unit properly when the finisher is installed.

- Possible causes -

- Poor connection between the IOB and bridge unit
- IOB defective

SC752: Finisher connection error

-Definition- [B']

The IOB cannot communicate with the finisher properly when the bridge unit is installed.

- Possible causes -

- Poor connection between the finisher and bridge unit
- IOB defective

SC760: ADF gate abnormal

Definition: [B]

The ADF Gate signal line between the ADF main board and the IOB is disconnected.

Possible Causes:

- ADF main board defective
- Input/output board defective
- Por connection (ADF Gate line) between the ADF main board and the IOB.

SC770: Shift tray motor error (optional shift tray unit)

-Definition- [B']

The shift tray half-turn sensor is not activated within a certain time after the shift tray motor turned on.

- Possible causes -

- Shift tray motor defective
- Shift tray half-turn sensor defective

SC900: Electrical total counter error

Definition: [B]

The electrical total counter is not working properly.

Possible Causes:

- NVRAM defective

SC901: Mechanical Total Counter

Definition: [B]

The mechanical total counter is not working properly.

Possible Causes:

- Mechanical total counter defective
- IOB defective
- Disconnected mechanical total counter

SC921: EMB (Copier feature expander) hardware error

Definition: [B]

The hardware of the MSU is defective.

Possible Causes:
- EMB (Copier feature expander) defective
- BICU defective

SC980: Program loading error

Definition: [A]

The program cannot load properly.

Possible Causes:
- The connection between the BICU and the IC board is poor.
- BICU board defective
- IC board or the program defective

NOTE: This SC should be cleared by trying to download again from an IC card.

SC990: Communication error between BICU and IOB

Definition: [B]

The BICU board cannot communicate with the IOB.

Possible Causes:
- The connection between the BICU board and the IOB is poor.
- BICU board defective
- IOB defective

SC999: Program version error

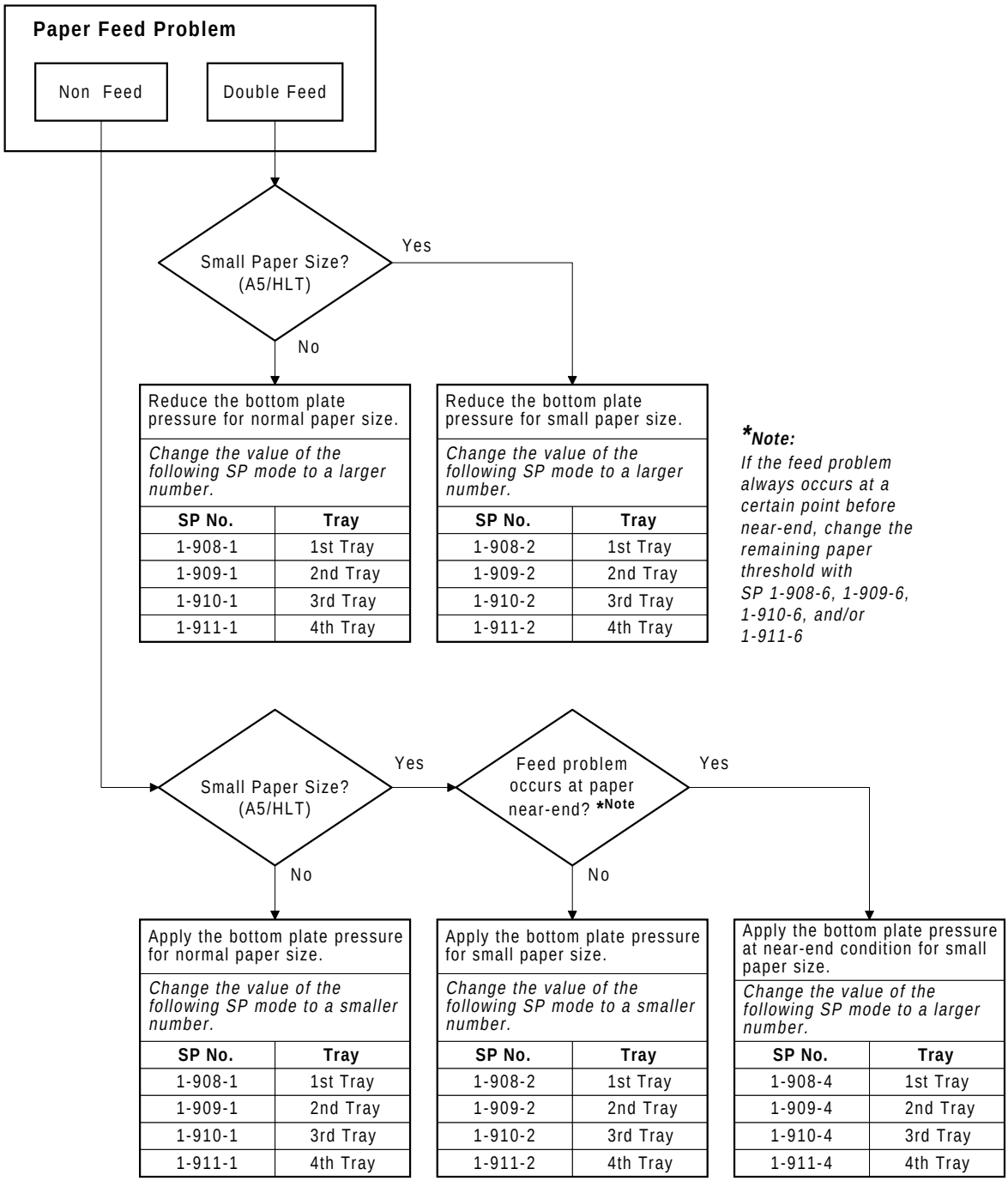
Definition: [B]

An incorrect type of main software was downloaded.

Possible Causes:
- The main software for another machine was downloaded to this machine.

7.2 PAPER FEED TROUBLESHOOTING

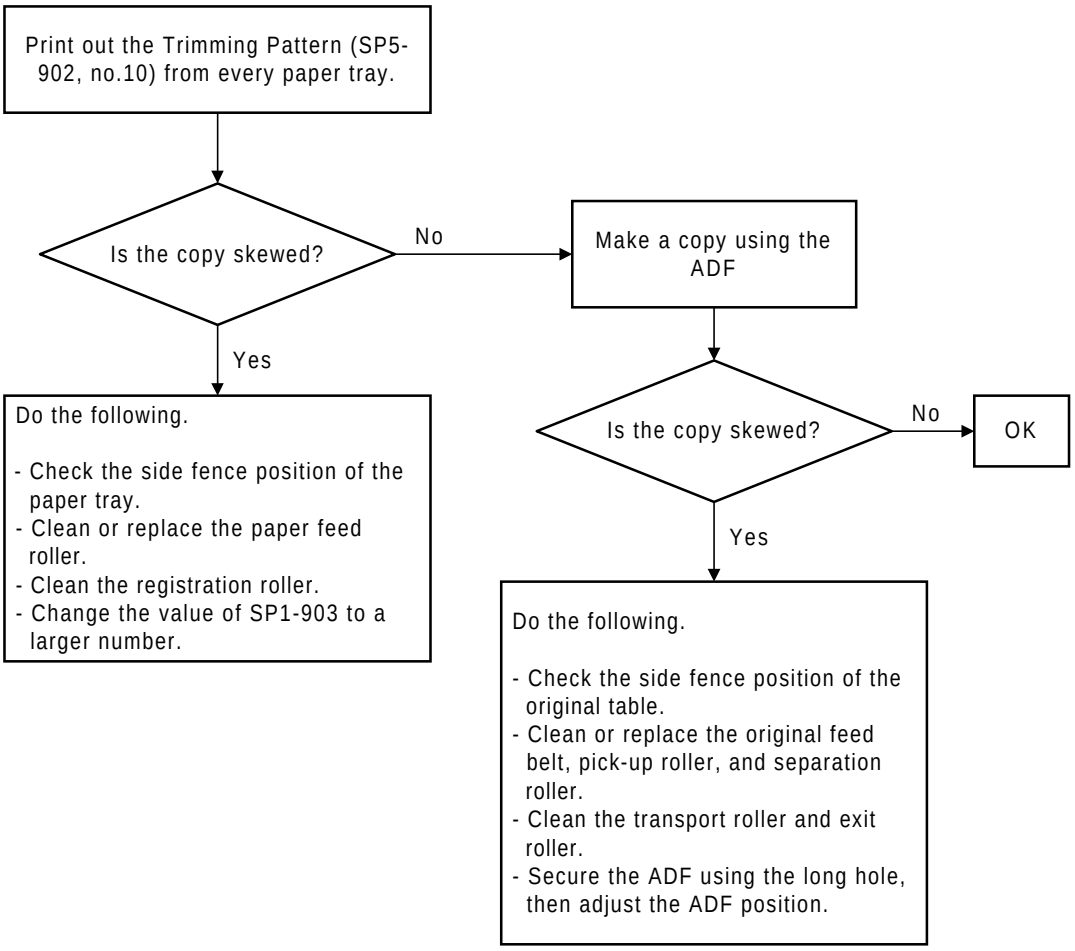
When a paper double feed or paper non feed problem occurs, fix the problem in accordance with the following flow chart.


Paper Feed Problem
Non Feed
Double Feed
Small Paper Size? (A5/HLT)
Yes
No
Reduce the bottom plate pressure for normal paper size.
Change the value of the following SP mode to a larger number.
SP No. Tray
1-908-1 1st Tray
1-909-1 2nd Tray
1-910-1 3rd Tray
1-911-1 4th Tray
Reduce the bottom plate pressure for small paper size.
Change the value of the following SP mode to a larger number.
SP No. Tray
1-908-2 1st Tray
1-909-2 2nd Tray
1-910-2 3rd Tray
1-911-2 4th Tray
*Note:
If the feed problem always occurs at a certain point before near-end, change the remaining paper threshold with SP 1-908-6, 1-909-6, 1-910-6, and/or 1-911-6
Small Paper Size? (A5/HLT)
Yes
No
Feed problem occurs at paper near-end? *Note
Yes
No
Apply the bottom plate pressure for normal paper size.
Change the value of the following SP mode to a smaller number.
SP No. Tray
1-908-1 1st Tray
1-909-1 2nd Tray
1-910-1 3rd Tray
1-911-1 4th Tray
Apply the bottom plate pressure for small paper size.
Change the value of the following SP mode to a smaller number.
SP No. Tray
1-908-2 1st Tray
1-909-2 2nd Tray
1-910-2 3rd Tray
1-911-2 4th Tray
Apply the bottom plate pressure at near-end condition for small paper size.
Change the value of the following SP mode to a larger number.
SP No. Tray
1-908-4 1st Tray
1-909-4 2nd Tray
1-910-4 3rd Tray
1-911-4 4th Tray

A265T500.WMF

7.3 SKEWED IMAGE

Do the following to fix a skewed image problem.


Print out the Trimming Pattern (SP5-902, no.10) from every paper tray.
Is the copy skewed?
No
Make a copy using the ADF
Yes
Do the following.
- Check the side fence position of the paper tray.
- Clean or replace the paper feed roller.
- Clean the registration roller.
- Change the value of SP1-903 to a larger number.
Is the copy skewed?
No
OK
Yes
Do the following.
- Check the side fence position of the original table.
- Clean or replace the original feed belt, pick-up roller, and separation roller.
- Clean the transport roller and exit roller.
- Secure the ADF using the long hole, then adjust the ADF position.

A265T501.WMF

7.4 TONER DENSITY

7.4.1 ADJUST THE TONER DENSITY CONTROL

If the toner density is too low

Change the value of SP 2-201-2 to “1” or “3”.

If the toner density is too high

Change the value of SP2-201-2 to “2” or “4”.

7.4.2 DIRTY BACKGROUND

Do either of the following.

- Change the value of SP2-929-1 from 2.80 V to 3.10 V.
- Change the value of SP2-201-1 to a value between – 550V and -500V

7.5 ELECTRICAL COMPONENT DEFECTS

7.5.1 SENSORS

Component (Symbol)	CN	Condition	Symptom
Scanner H.P	337-2 (IOB)	Open	SC120 is displayed.
		Shorted	The CPU does not detect the scanner home position and the scanner motor does not stop.
Platen Cover	337-5 (IOB)	Open	APS and ARE do not function correctly.
		Shorted	No symptom
Original Width	(IOB)	Open	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Original Length-1	(IOB)	Open	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Original Length-2	(IOB)	Open	The CPU cannot detect the original size properly. APS and ARE do not function correctly.
		Shorted	
Toner Density	302-3 (IOB)	Open	SC390 is displayed
		Shorted	
1st Paper End	306-2 (IOB)	Open	The Paper End indicator lights even if paper is placed in the 1st paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the 1st paper tray.
2nd Paper End	307-A2 (IOB)	Open	The Paper End indicator lights even if paper is placed in the 2nd paper tray.
		Shorted	The Paper End indicator does not light even if there is no paper in the 2nd paper tray.
Image Density	321-3 (IOB)	Open	SC392 is displayed (see note)
		Shorted	
Paper Over Flow	324-5 (IOB)	Open	The paper overflow message is not displayed when the paper overfull condition exist.
		Shorted	The paper overflow message is displayed.
Paper Exit	324-2 (IOB)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Upper Relay	306-5 (IOB)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.

Component (Symbol)	CN	Condition	Symptom
Lower Relay	307-A5 (IOB)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
Registration	321-6 (IOB)	Open	The Paper Jam indicator will light whenever a copy is made.
		Shorted	The Paper Jam indicator lights even if there is no paper.
1st Paper Lift	305-7 (IOB)	Open	SC501 will be displayed.
		Shorted	Paper jam will occur during copying.
2nd Paper Lift	305-10 (IOB)	Open	SC502 will be displayed.
		Shorted	Paper jam will occur during copying.
1st Paper Height – 1	307-B2 (IOB)	Open	The CPU cannot determine the paper near-end condition properly.
		Shorted	
1st Paper Height – 2	307-B5 (IOB)	Open	The CPU cannot determine the paper near-end condition properly.
		Shorted	
2nd Paper Height – 1	307-B9 (IOB)	Open	The CPU cannot determine the paper near-end condition properly.
		Shorted	
2nd Paper Height – 2	307-B12 (IOB)	Open	The CPU cannot determine the paper near-end condition properly.
		Shorted	

NOTE: An SC condition occurs only when a new PCU is being installed in the machine. During copying, if the ID sensor fails, the image density will be changed.

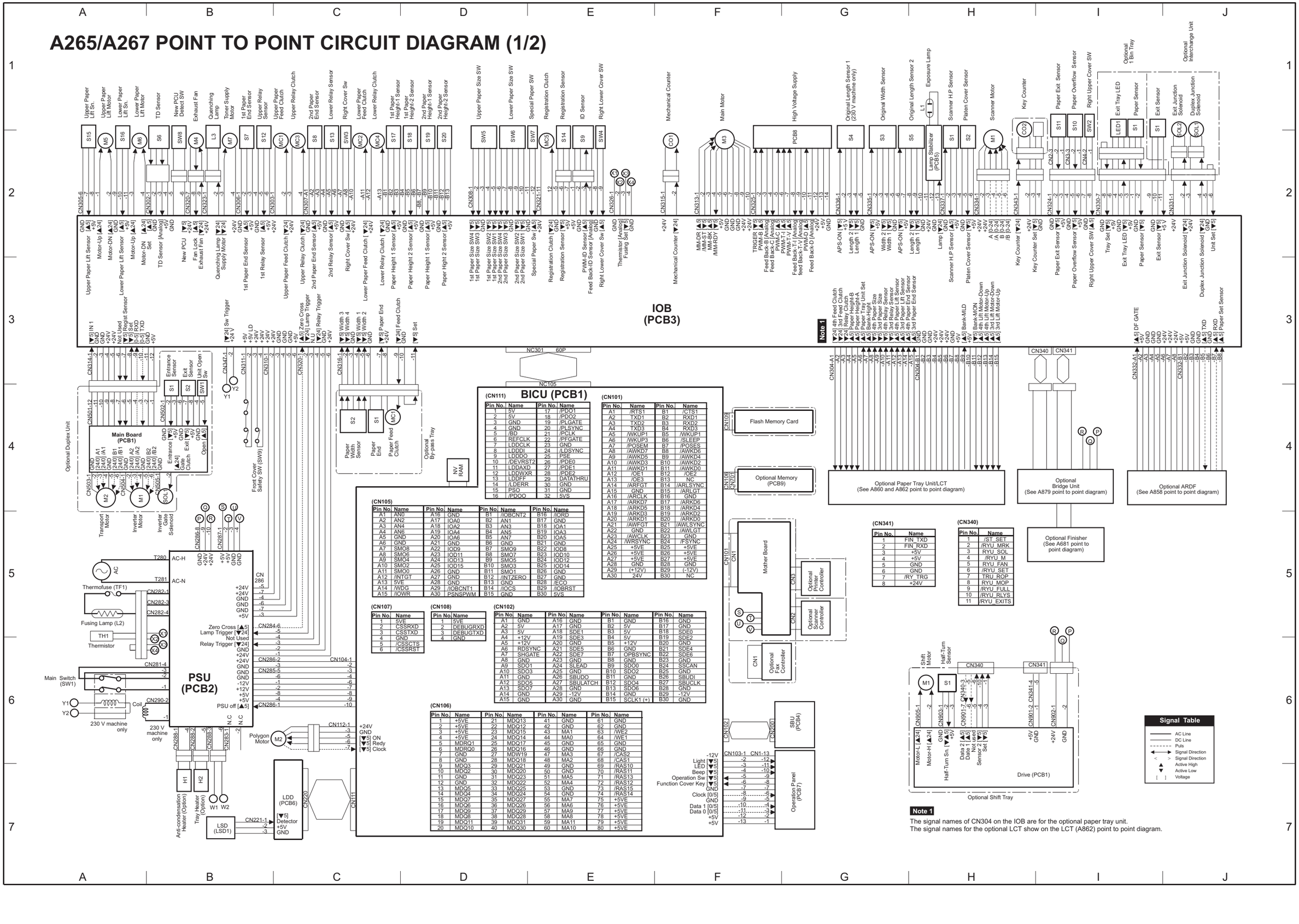
7.5.2 SWITCHES

Component (Symbol)	CN	Condition	Symptom
Main	281-1,2 (PSU)	Open	The machine does not turn on.
		Shorted	The machine does not turn off.
Right Upper Cover	324-8 (IOB)	Open	The Cover Open indicator is not lit even if the right upper cover is opened.
		Shorted	The Cover Open indicator is lit even if the right upper cover is closed.
Right Cover	308-9 (IOB)	Open	The Cover Open indicator is not lit even if the right cover is opened.
		Shorted	The Cover Open indicator is lit even if the right cover is closed.
Right Lower Cover	307-A8 (IOB)	Open	The Cover Open indicator is not lit even if the right lower cover is opened.
		Shorted	The Cover Open indicator is lit even if the right lower cover is closed.
Upper Paper Size	308-1,2,4,5 (IOB)	Open	The CPU cannot detect the proper paper size, and misfeeds may occur when a copy is made.
		Shorted	
Lower Paper Size	308-6,7,9,10 (IOB)	Open	The CPU cannot detect the proper paper size, and misfeeds may occur when a copy is made.
		Shorted	
Special Paper	308-12 (IOB)	Open	No symptom. However, the image density problem will occur when using a thick paper.
		Shorted	
New PCU Detect	302-6 (IOB)	Open	The TD sensor initial setting procedure is not performed when a new PCU is installed.
		Shorted	The TD sensor initial setting procedure is performed whenever the front cover is closed.
Front Cover Safety	311-2, 4 (IOB)	Open	The Cover Open indicator is not lit even if the front cover is opened.
		Shorted	The Cover Open indicator is lit even if the front cover is closed.
Operation	103-5 (BICU)	Open	The LCD does not off even if the operation switch is turned off.
		Shorted	The LCD does not on even if the operation switch is turned on.

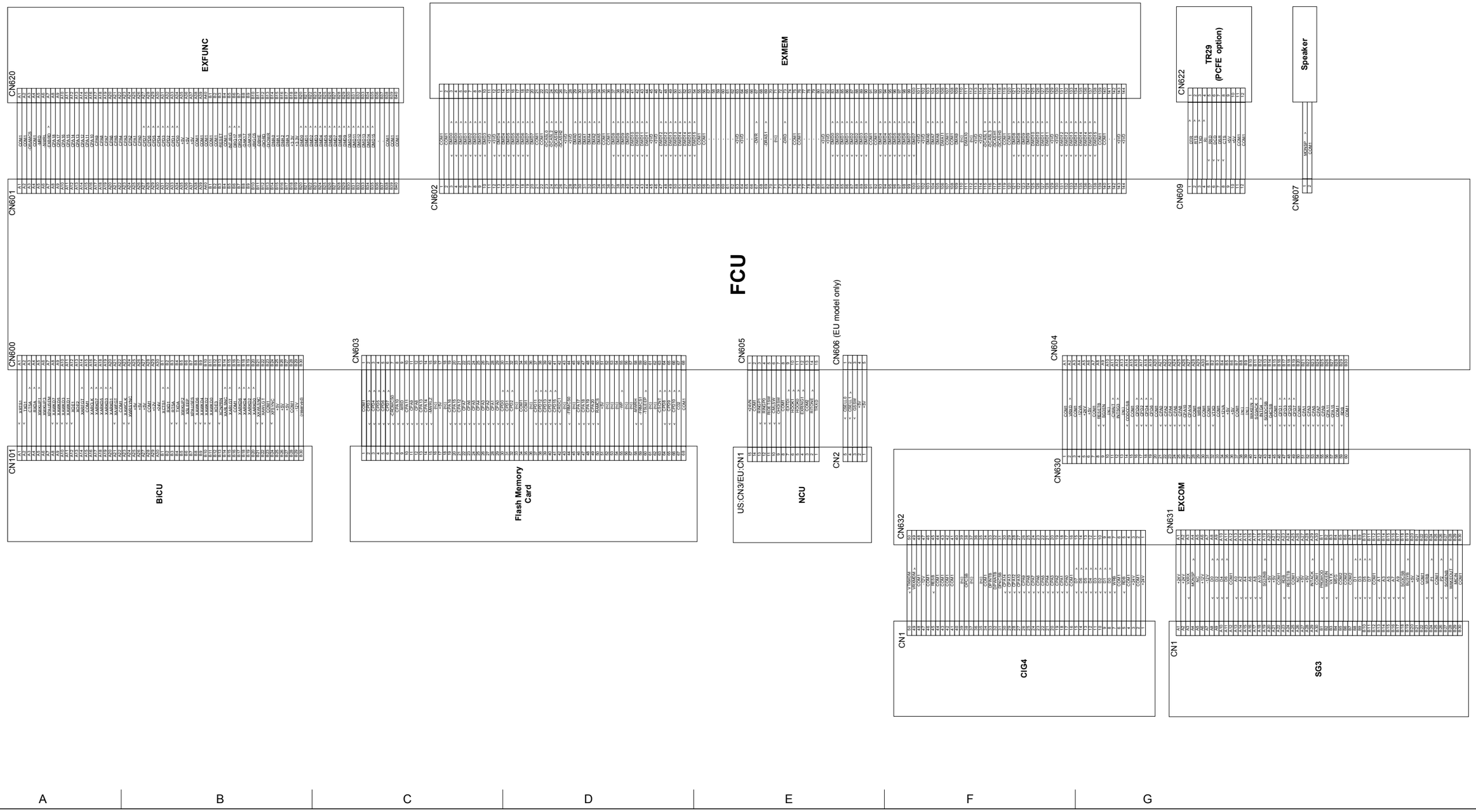
7.6 BLOWN FUSE CONDITIONS

Fuse	Rating		Symptom when turning on the main switch
	115 V	220 ~ 240 V	
Power Supply Board			
FU1	15 A/250 V	----	No response.
FU2	8 A/125 V	3.15 A/250 V	No response
FU3	2 A/125 V	2 A/250V	Anti-condensation/Tray Heater does not turn on.
FU4	4 A/125 V	4 A/250V	“Doors/Covers Open” is displayed then SC194 is displayed
FU5	4 A/125 V	4 /250 V	Optional peripherals does not work
FU6	4 A/125 V	4 A/250V	SC752 is displayed
FU7	2 A/125 V	2 A/250 V	SC990 is displayed

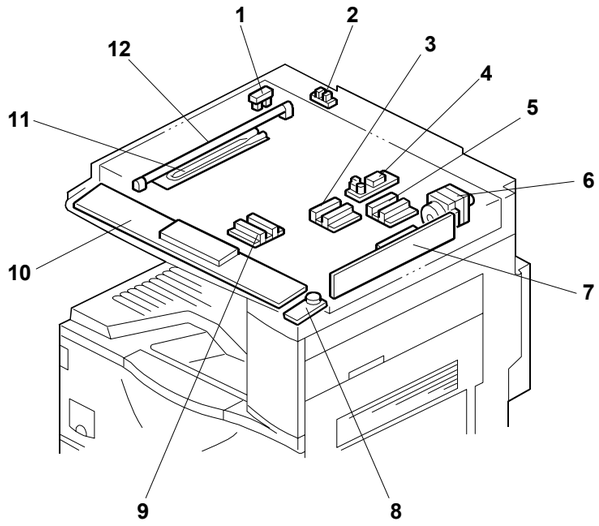
A265/A267 POINT TO POINT CIRCUIT DIAGRAM (1/2)

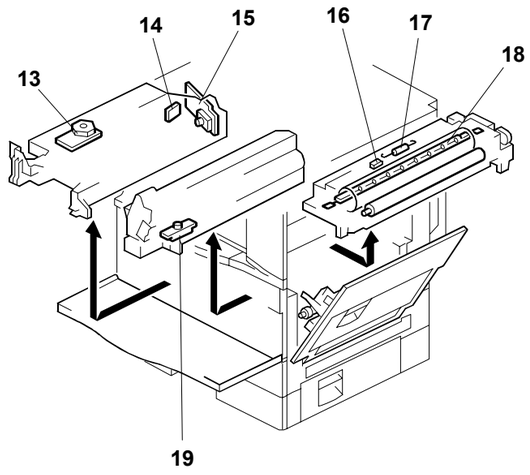

IOB (PCB3)
PSU (PCB2)
BICU (PCB1)
Main Board (PCB1)
Mother Board
Drive (PCB1)
Operation Panel (PCB7)
LDD (PCB6)
Optional Paper Tray Unit/LCT (See A860 and A862 point to point diagram)
Optional Bridge Unit (See A879 point to point diagram)
Optional ARDF (See A858 point to point diagram)
Optional Finisher (See A681 point to point diagram)
Optional Shift Tray
Flash Memory Card
Optional Memory (PCB9)
Optional Printer Controller
Optional Scanner Controller
Optional Fax Controller
SBU (PCB4)
Signal Table
Note 1
The signal names of CN304 on the IOB are for the optional paper tray unit.
The signal names for the optional LCT show on the LCT (A862) point to point diagram.

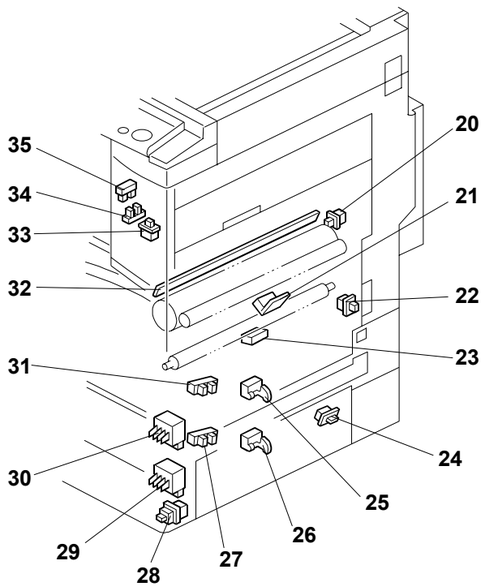
A265/A267 POINT TO POINT DIAGRAM (2/2)

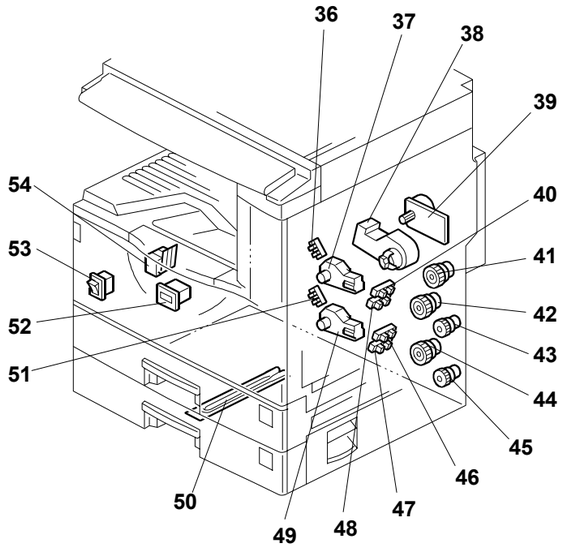


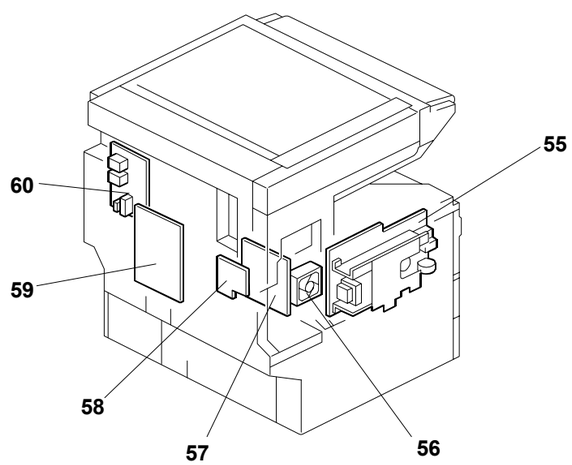
COPIER (A265/A267) ELECTRICAL COMPONENT LAYOUT







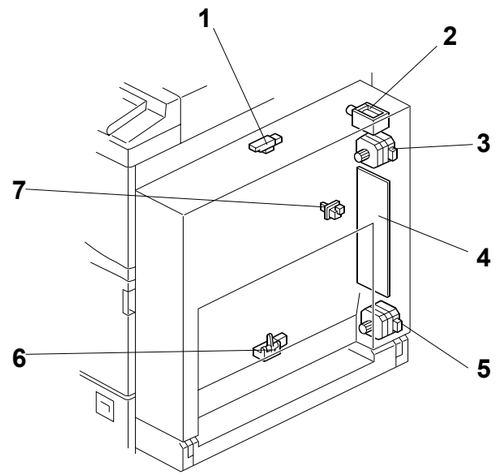




Symbol	Name	Index No.	P to P
Motors			
M1	Scanner	6	H2
M2	Polygonal Mirror	13	C6
M3	Main	39	F2
M4	Exhaust Fan	56	B2
M5	Upper Paper Lift	37	A2
M6	Lower Paper Lift	49	A2
M7	Toner Supply	38	B2
Magnetic Clutches			
MC1	Upper Paper Feed	42	C2
MC2	Lower Paper Feed	44	C2
MC3	Upper Relay	43	C2
MC4	Lower Relay	45	C2
MC4	Registration	41	E2
Switches			
SW1	Main	53	A6
SW2	Right Upper Cover	33	I1
SW3	Right Cover	22	C2
SW4	Right Lower Cover	24	E2
SW5	Upper Paper Size	30	D2
SW6	Lower Paper Size	29	D2
SW7	Special Paper	28	E2
SW8	New PCU Detect	20	B2
SW9	Front Cover Safety	54	B4
SW10	Operation	8	---
Sensors			
S1	Scanner HP	1	H2
S2	Platen Cover	2	H2
S2	Original Width	9	G2
S4	Original Length 1	3	G2
S5	Original Length 2	5	G2
S6	Toner Density (TD)	19	B2
S7	1st Paper End	31	B2
S8	2nd Paper End	27	C2
S9	Image Density (ID)	21	E2
S10	Paper Overflow	35	I1
S11	Paper Exit	34	I1
S12	Upper Relay	25	B2
S13	Lower Relay	26	C2
S14	Registration	23	E2
S15	1st Paper Lift	36	A2
S16	2nd Paper Lift	51	A2
S17	1st Paper Height – 1	40	C2
S18	1st Paper Height – 2	48	D2
S19	2nd Paper Height – 1	46	D2
S20	2nd Paper Height – 2	47	D2

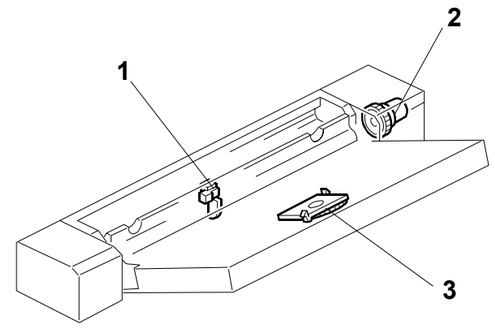
Symbol	Name	Index No.	P to P
PCBs			
PCB1	BICU (Base Engine and Image Control Unit)	57	E4
PCB2	PSU (Power Supply Unit)	55	B5
PCB3	IOB (Input/Output Board)	59	F3
PCB4	SBU (Sensor Board Unit)	7	G6
PCB5	Lamp Stabilizer	4	H2
PCB6	LDD (Laser Diode Driver)	15	C7
PCB7	Operation Panel	10	G7
PCB8	High Voltage Supply	60	G2
PCB9	Memory (Option)	58	F4
Lamps			
L1	Exposure Lamp	12	H1
L2	Fusing Lamp	18	A1
L3	Quenching Lamp	32	B2
Heaters			
H1	Anti-condensation (Option)	11	B7
H2	Tray (Option)	50	B7
Others			
TF1	Fusing Thermofuse	17	A5
TH1	Fusing Thermistor	16	A5
LSD 1	Laser Synchronization Detector	14	B7
CO1	Mechanical Counter	52	F2
CO2	Key Counter (Option)	---	H2

DUPLEX (A896)/1-BIN TRAY (A898)/BY-PASS TRAY (A899)/INTERCHENGE UNIT (B300)/SHIFT TRAY (B313) ELECTRICAL COMPONENT LAYOUT



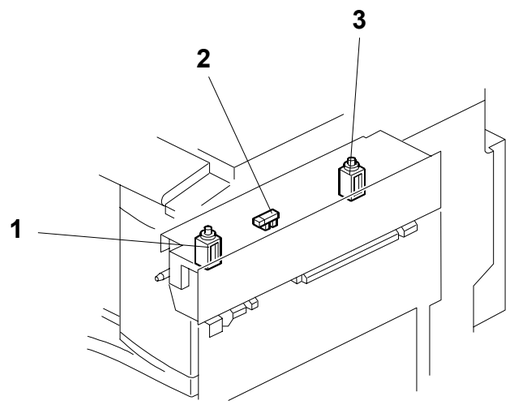
DUPLEX (A896)

Symbol	Name	Index No.	P to P
Motors			
M1	Inverter	3	A4
M2	Transport	5	A4
Sensors			
S1	Entrance	1	B4
S2	Exit	6	B4
Switches			
SW1	Duplex Unit Open	7	B4
Solenoids			
SOL1	Inverter Gate	2	B4
PCBs			
PCB1	Main	4	A4



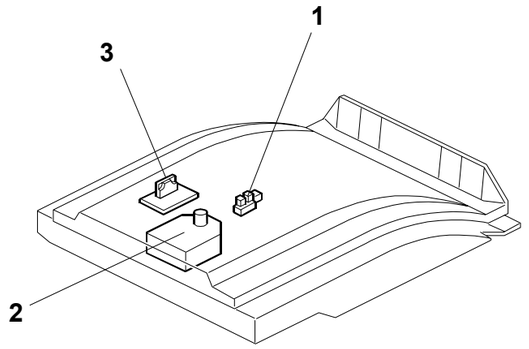
BY-PASS TRAY (A899)

Symbol	Name	Index No.	P to P
Sensors			
S1	Paper End	1	C4
S2	Paper Size Sensor Board	3	C4
Magnetic Clutches			
MC1	Paper Feed	2	D4



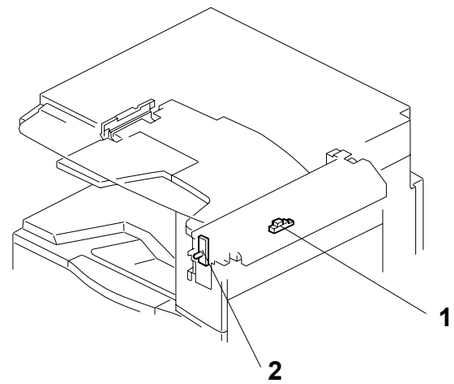
INTERCHANGE UNIT (B300)

Symbol	Name	Index No.	P to P
Sensors			
S1	Exit	2	I2
Solenoids			
SOL1	Duplex Junction Gate	3	J2
SOL2	Exit Junction Gate	1	J2



SHIFT TRAY (B313)

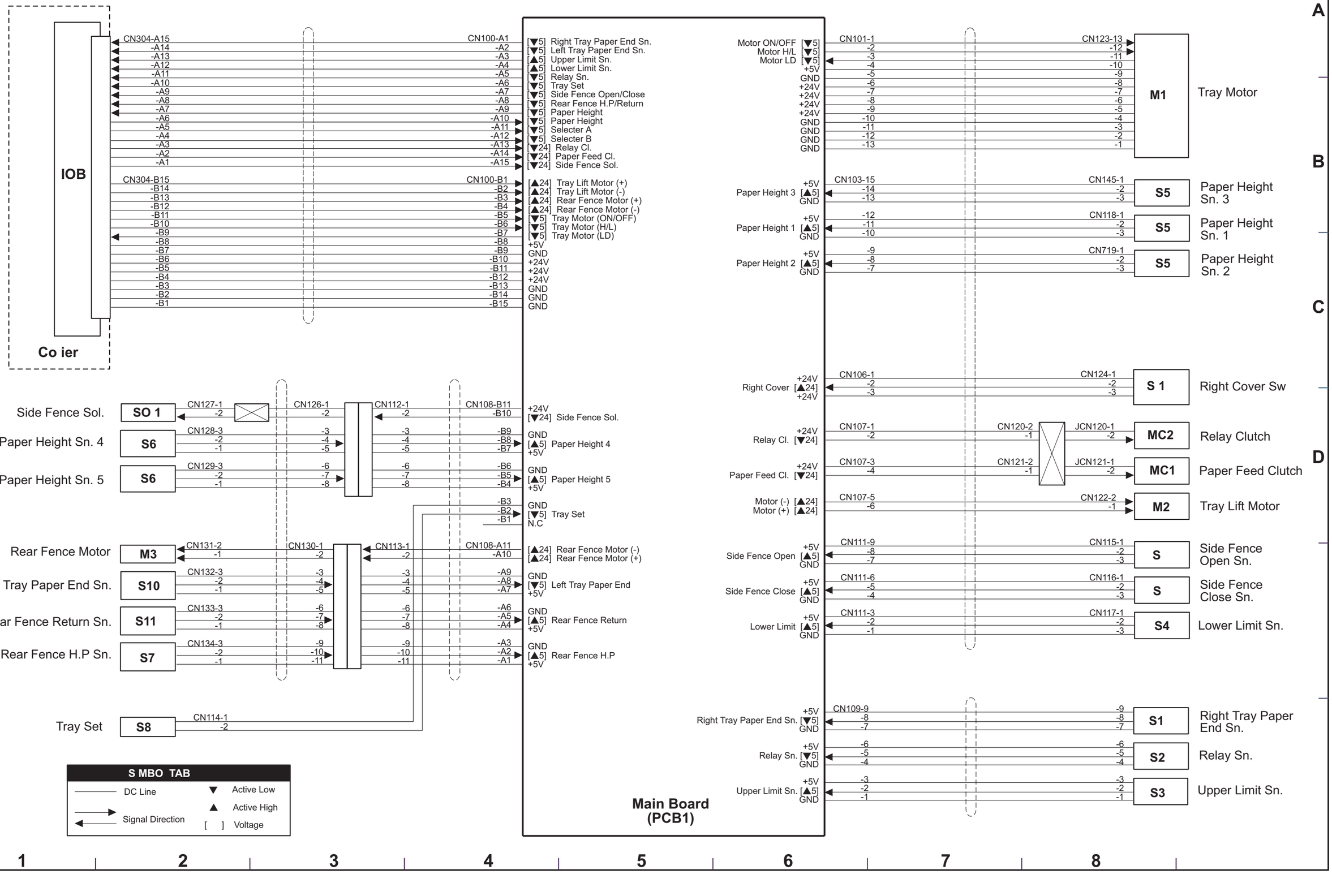
Symbol	Name	Index No.	P to P
Motors			
M1	Shift	2	H6
Sensors			
S1	Half Turn	1	H6
PCBs			
PCB1	Drive	3	H6



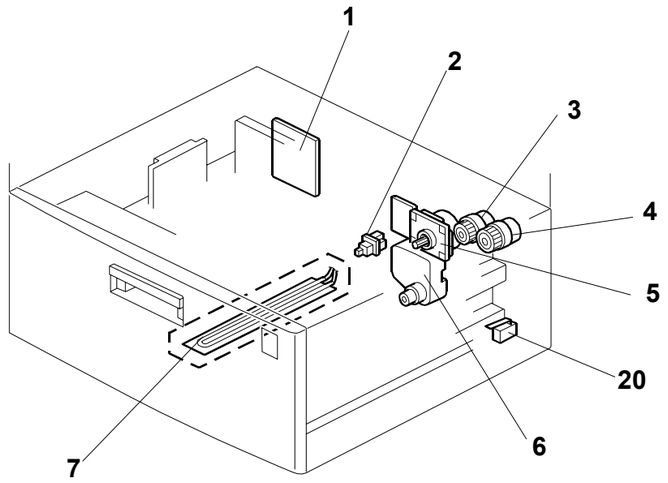
1-BIN TRAY (A898)

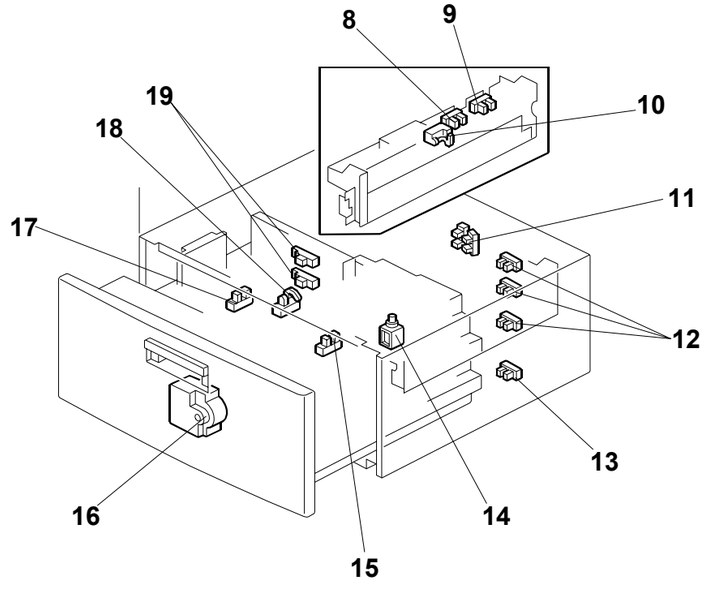
Symbol	Name	Index No.	P to P
Sensors			
S1	Paper	1	I2
LEDs			
LED1	1 Bin Exit Tray	2	I2

CT (A862) POINT TO POINT DIAGRAM



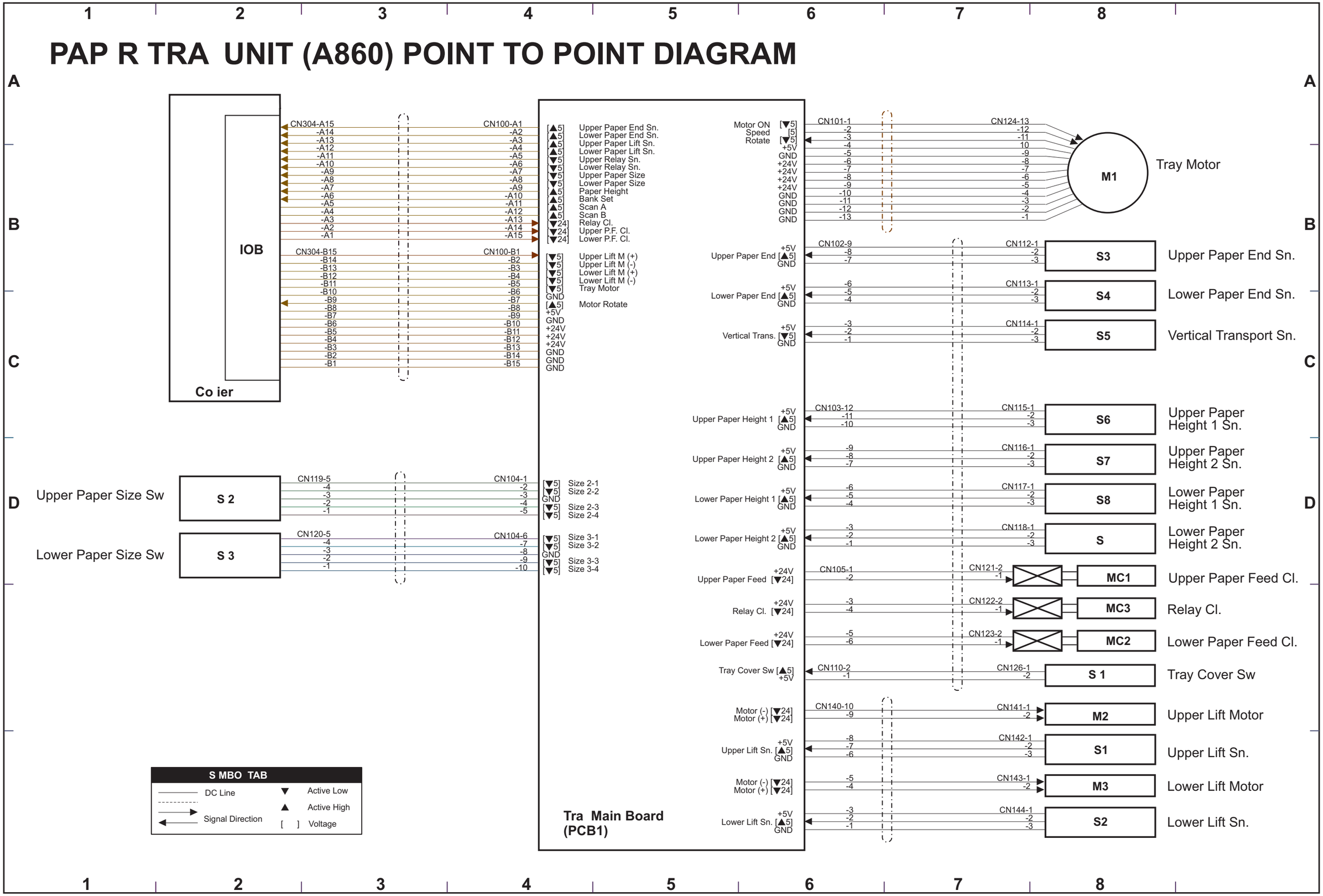
LCT ELECTRICAL COMPONENT LAYOUT (A862)



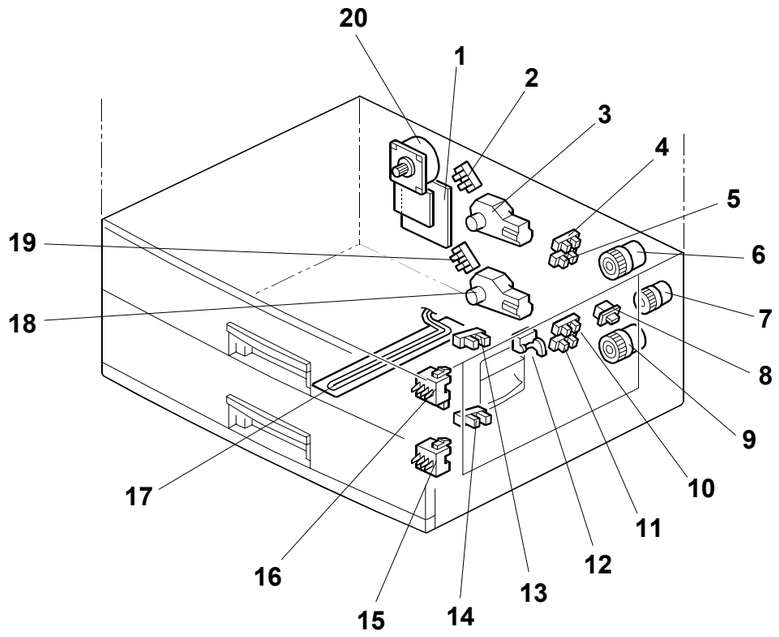


Symbol	Name	Index No.	P to P
Motors			
M1	Tray Motor	5	B8
M2	Tray Lift Motor	6	D8
M3	Rear Fence Motor	16	E2
Sensors			
S1	Right Tray Paper End	8	F8
S2	Relay	10	F8
S3	Upper Limit	9	F8
S4	Lower Limit	13	E8
S5	Paper Height 1, 2, 3	12	B8, C8
S6	Paper Height 4, 5	19	D2
S7	Rear Fence Home Position	17	E2
S8	Tray	2	F2
S9	Side Fence Open/Closed	11	E8
S10	Rear Fence Return	15	E2
S11	Left Tray Paper End	18	E2
Solenoids			
SOL1	Side Fence	14	D2
Magnetic Clutches			
MC1	Paper Feed	4	D8
MC2	Relay	3	D8
PCBs			
PCB1	Main	1	F5
Switches			
SW1	Right Cover	20	D8

PAP R TRA UNIT (A860) POINT TO POINT DIAGRAM

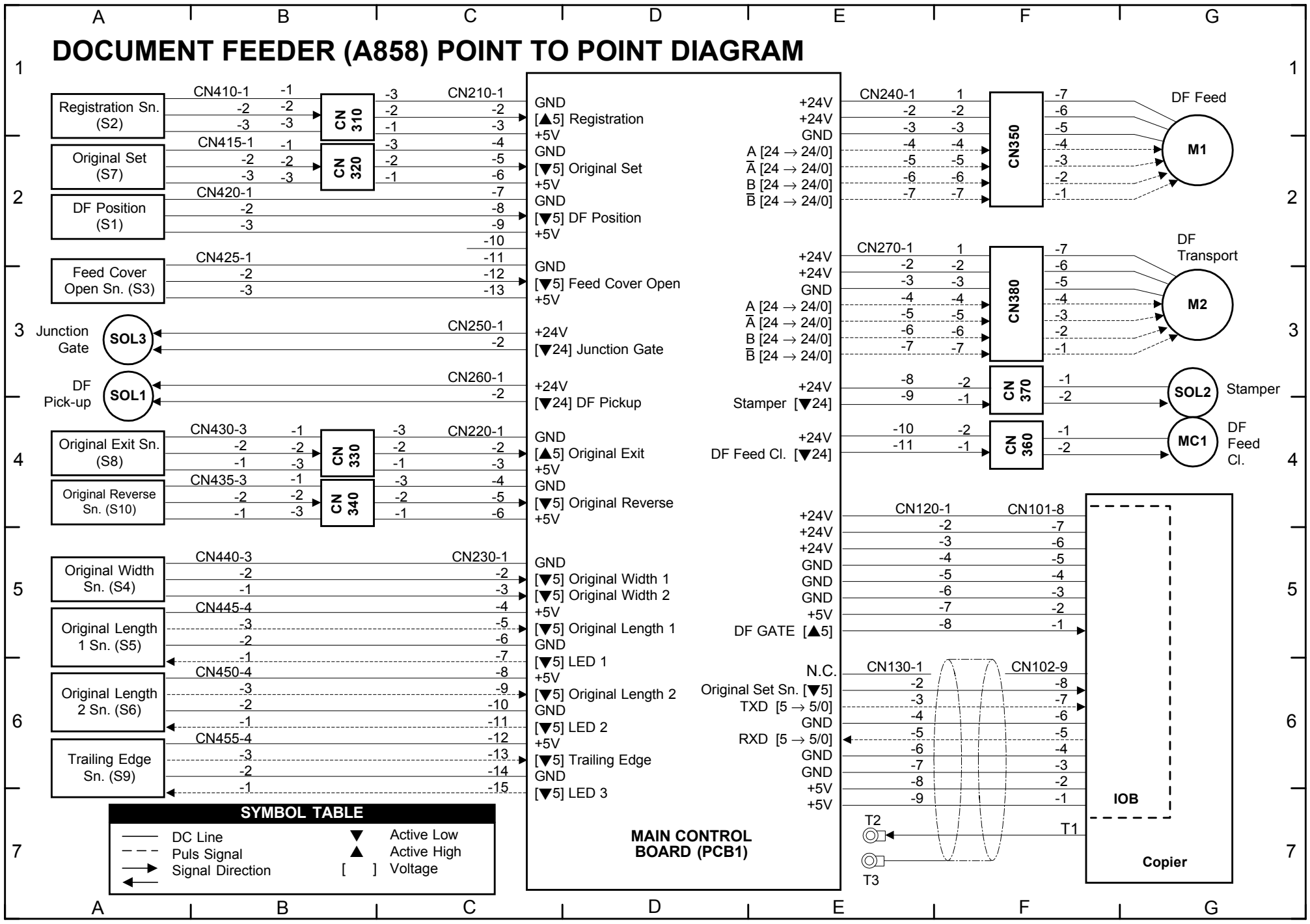


PAPER TRAY UNIT ELECTRICAL COMPONENT LAYOUT (A860)

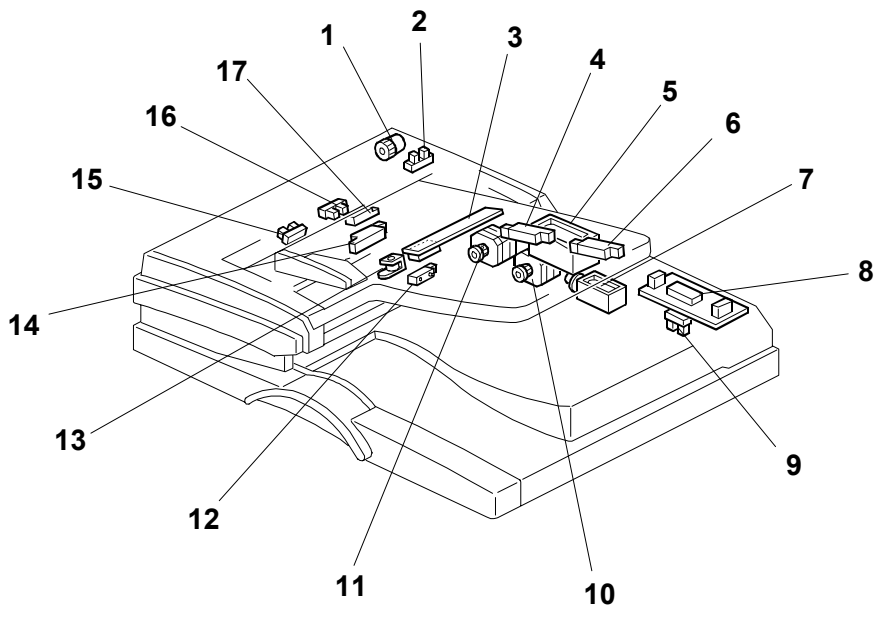


Symbol	Name	Index No.	P to P
Motors			
M1	Tray	20	B8
M2	Upper Lift	3	E8
M3	Lower Lift	18	F8
Sensors			
S1	Upper Lift	2	F8
S2	Lower Lift	19	F8
S3	Upper Paper End	13	B8
S4	Lower Paper End	14	C8
S5	Vertical Transport	12	C8
S6	Upper Paper Height 1	5	C8
S7	Upper Paper Height 2	4	D8
S8	Lower Paper Height 1	11	D8
S9	Lower Paper Height 2	10	D8
Switches			
SW1	Tray Cover	8	E8
SW2	Upper Paper Size	15	D2
SW3	Lower Paper Size	16	D2
Magnetic Clutches			
MC1	Upper Paper Feed	6	D8
MC2	Lower Paper Feed	9	E8
MC3	Relay	7	E8
PCBs			
PCB1	Tray Main	1	F5

DOCUMENT FEEDER (A858) POINT TO POINT DIAGRAM

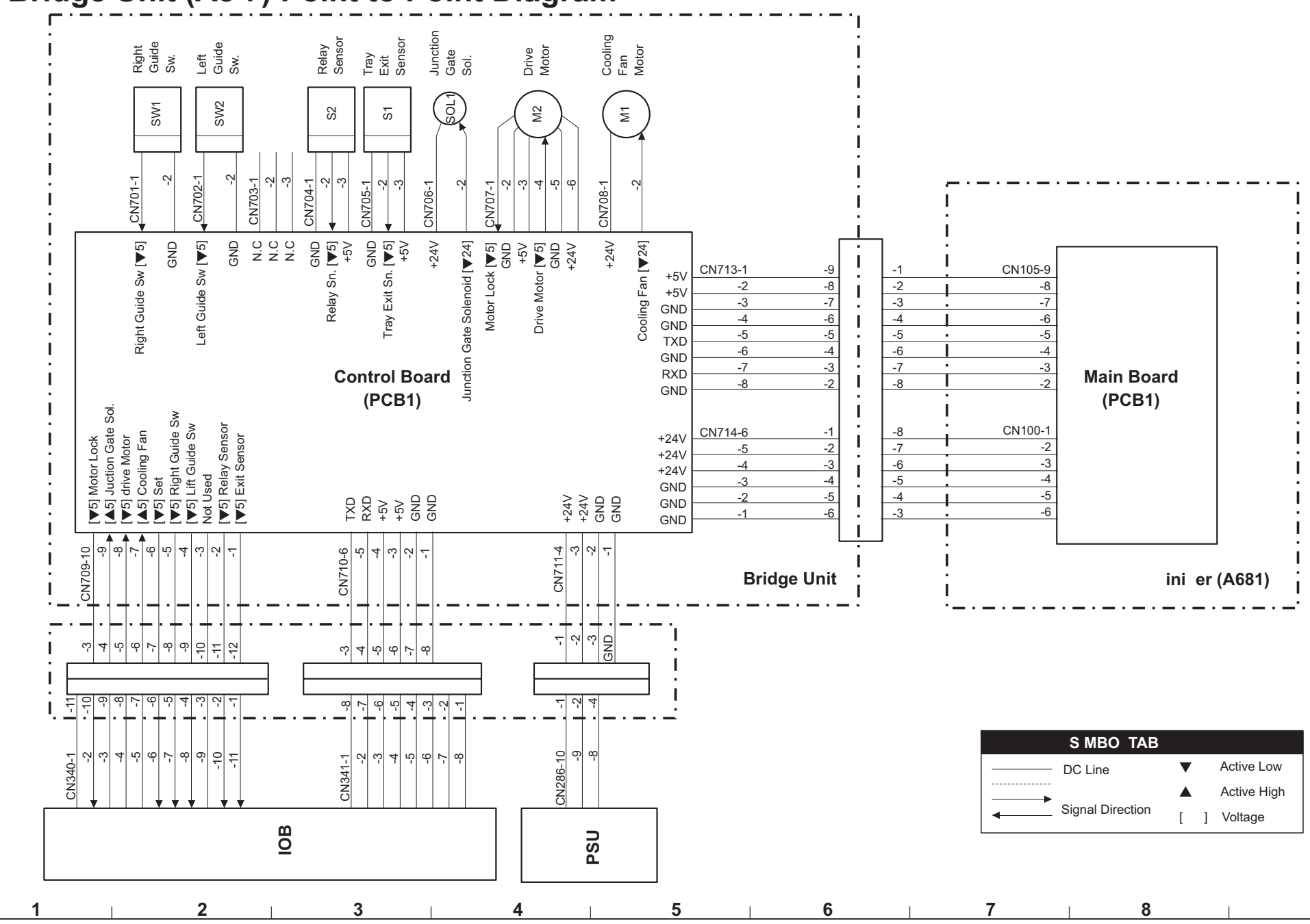


DOCUMENT FEEDER ELECTRICAL COMPONENT LAYOUT (A858)

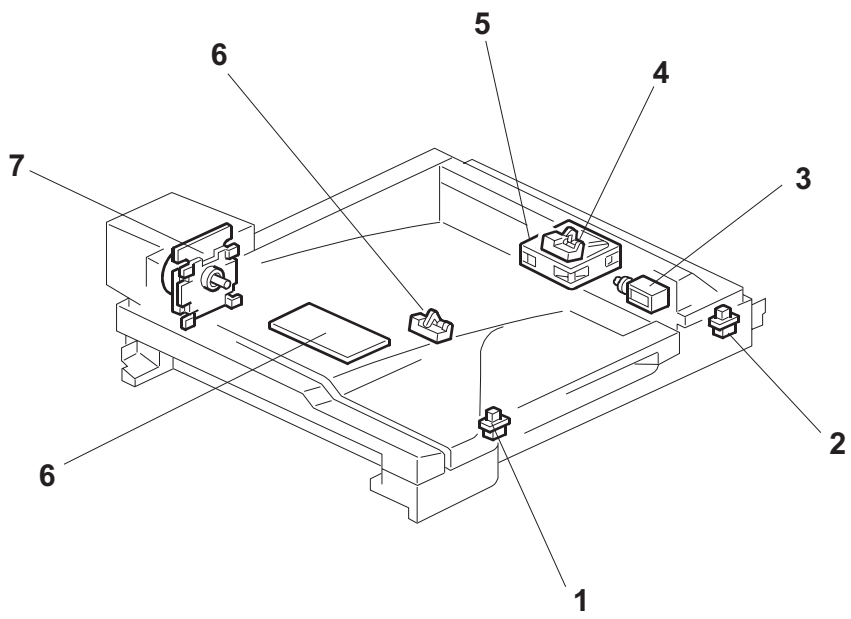


Symbol	Name	Index No.	P to P
Motors			
M1	DF Feed	10	G2
M2	DF Transport	11	G3
Sensors			
S1	DF Position	9	A2
S2	Registration	17	A1
S3	Feed Cover Open Sensor	2	A3
S4	Original Width Sensor Board	3	A5
S5	Original Length - 1	4	A5
S6	Original Length - 2	6	A6
S7	Original Set	15	A2
S8	Original Exit	12	A4
S9	Original Trailing Edge	14	A6
S10	Original Reverse Sensor	16	A4
Solenoids			
SOL1	DF Pick-up	5	A3
SOL2	Stamp	13	G3
SOL3	Junction Gate	7	A3
Clutches			
MC1	DF Feed	1	G4
PCBs			
PCB1	DF Drive	8	G7

Bridge Unit (A8 7) Point to Point Diagram



BRIDG UNIT CTRICA COMPON NT A OUT (A8 7)



S mbol	Name	Inde No.	P to P
Motor			
M1	Cooling Fan	5	B5
M2	Drive Motor	7	B4
Sen or			
S1	Tray Exit	4	B3
S2	Relay	6	B3
S it e			
SW2	Right Guide	2	B2
SW3	Left Guide	1	B2
Solenoid			
SOL1	Junction Gate	3	B4
PCB			
PCB1	Bridge Unit Control Board	8	C3